

**Investigating Causes and Impacts of Poor Contract Administration in Road
Construction: The Case of West Arsi Zone Road Construction Projects**



Awel Hebo Gatiso

A Thesis Submitted to the Department of Civil Engineering

School of Civil Engineering and Architecture

Presented in Partial Fulfillment of the Requirements for the Masters of Science Degree in
Civil Engineering (Specialization in Construction Engineering and Management)

Office of Graduate Studies

Adama Science and Technology University

September, 2022

Adama, Ethiopia

**Investigating Causes and Impacts of Poor Contract Administration in Road
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Declaration

I hereby declare that this Master Thesis entitled “**Investigating Causes and Impacts of Poor Contract Administration in Road Construction: The Case of West Arsi Zone Road Construction Projects**” is my original work. That is, it has not been submitted for the award of any academic degree, diploma or certificate in any other university. All sources of materials that are used for this thesis have been duly acknowledged through citation.

Awel Hebo Gatiso

Name of student

Signature

Date

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I/we, the advisor(s) of this thesis, hereby certify that I/we have read the revised version of the thesis entitled **“Investigating Causes and Impacts of Poor Contract Administration in Road Construction: The Case of West Arsi Zone Road Construction Projects”** prepared under my/our guidance by **Awel Hebo Gatiso** submitted in partial fulfillment of the requirements for the Masters of Science Degree in **Civil Engineering (Specialization in Construction Engineering and Management)**. Therefore, I/we recommend the subprojects of revised version of the thesis to the department following the applicable procedures.

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Approval Sheet

I/we, the advisors of the thesis entitled “**Investigating Causes and Impacts of Poor Contract Administration in Road Construction: The Case of West Arsi Zone Road Construction Projects**” and developed by Awel Hebo Gatiso, hereby certify that the recommendation and suggestions made by the board of examiners are appropriately incorporated into the final version of the thesis.

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Approval Sheet of Board of Examiners

We, the undersigned, members of the Board of Examiners of the thesis open defense by **Awel Hebo Gatiso** have read and evaluated the thesis entitled **“Investigating Causes and Impacts of Poor Contract Administration in Road Construction: The Case of West Arsi Zone Road Construction Projects”** and examined the candidate during open defense. This is, therefore, to certify that the thesis is accepted for partial fulfillment of the requirement of the Masters of Science Degree in **Civil Engineering (Specialization in Construction Engineering and Management)**.

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Abstract

The road construction industry is an important part of the economic backbone in Ethiopia and poor contract administration in road Construction projects is a significant cause of inefficient construction process. The purpose of this research study was to identify the root causes, to assess the impact and to determine the appropriate mitigation measures to improve the existing contract administration process in road construction projects in West Arsi Zone. The type of this research is quantitative and qualitative as well as inferential statistics in its behavior. This study was conducted through a questionnaire survey and case study design. The target populations in this study were 95 road projects being constructed in the West Arsi Zone road construction projects and the respondents were the professional employees assigned to the road construction projects. In this study, the sample was considered using systematic random sampling and so that the representative sample of 77 respondents were considered for this study analysis. From the study result; the major root cause factor of poor contract administration are financial problem, change in specification & design and differing site condition with RII of 80 %, 79.43 % and 77.71% respectively. Whereas the major critical impact factors of poor contract administration are mainly cost overrun, poor quality and degradation of standards with RII of 79.14%, 78% and 75.71% respectively. The mitigation measures of the quality problems of the road construction projects in order to improve the existing contract administration processes in West Arsi Zone road construction projects are regulating contractors, quality management of contractor and regular site supervision and contract Administration. The study concluded that; all construction stake holders should participate with sensitive and important decision-making in order to solve these problems and develop project performance to minimize disputes between owner and contractors. This research strongly suggested that all concerned body should take a measure of applying contract administration procedures.

Key Words: - Contract, Contract Administration, Mitigation Measure, Root Cause, Impact, Road Construction Project, Monitoring and Performance, Value Engineering

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Table of Contents

Declaration	i
Recommendation.....	ii
Approval Sheet.....	iii
Approval Sheet of Board of Examiners.....	iv
Abstract	v
ACKNOWLEDGEMENT	vi
List of Tables.....	xi
List of Figures	xii
List of Abbreviations.....	xiii
CHAPTER ONE	1
1. INTRODUCTION.....	1
1.1. Introduction over View	1
1.2. Background of the Study	1
1.3. Statement of the Problem.....	4
1.4. General objective	6
1.4.1. Specific Objectives.....	6
1.4. Research Questions	6
1.5. Hypotheses of the Research	6
1.6 Significance of the Study.....	7
1.7 Scope of the study	8
1.7.1 Thematic Scope.....	8
1.7.2 Spatial Scope	8
1.7.3 Temporal Scope	10
1.8 Limitation of the study.....	10
1.9 Organization and Contents of the Research	10
1.10 Definition of Important Technical Terms	11
CHAPTER TWO	13
2. LITERATURE REVIEW	13
2.1. Introduction	13
2.2. Theoretical Review	13
2.2.1 Construction Industry.....	13
2.2.2 Construction Projects	14
2.2.3 Road construction Projects	14
2.2.4. Contract Definitions.....	15
2.2.5. Construction Stakeholders	16

2.2.6. Construction Contracts.....	20
2.2.7. Types of Construction Contracts	21
2.2.8. Road construction Contract	22
2.3. Contract Documents.....	23
2.3.1. Priority of documents.....	23
2.4. Acceptance of Works.....	23
2.4.1. Provisional Acceptance of Works	23
2.4.2. Final Acceptance	24
2.5. Contract Administration Definitions.....	24
2.6. Poor Contract Administration in Road Construction Projects	26
2.6.1 Identifying Root Causes of Poor Contract Administration in Road Construction .	27
2.6.2. Assessing the Impact of Poor Contract Administration in Road Construction Projects.....	29
2.6.3. Determining Appropriate Mitigation Measures of Poor Contract Administration in Road Construction Projects	30
2.7. Empirical Review.....	33
2.7.1. Identifying Root Causes of Poor Contract Administration in Road Construction	33
2.7.1.1. Causing Factors to Road Construction Projects Based on Cost Performance	34
2.7.1.2. Causing Factors to Road Construction Projects Based on Time Performance ...	35
2.7.1.3. Causing Factors to Road Construction Projects Based on Quality performance	37
2.7.1.4 Summary of Reasons of Delay and Cost Overruns in Road Construction Projects	37
2.7.2.5. Termination of Road Construction Projects Contracts.....	51
2.8. Determining Appropriate Mitigation Measures of Poor Contract Administration in Road Construction Projects	53
2.8.1. Proper Planning	54
2.8.2. Risk and risk management.....	55
2.8.3. Monitoring Performance	56
2.8.4. Contract Remedies	57
2.8.5. Summary of Mitigation Measures for Controlling Delays and Cost Overrun in Road Construction Projects	57
2.8.6. Communication among Construction Project Stakeholders.....	68
2.8.7. Value Engineering.....	71
2.9. Policy and Strategy Review	71
2.9.1. Policy Review	71
2.9.2. Strategy Review.....	72
2.10. Best Experience and Lesson Learnt	73

2.10.1. The Best Experience the Researcher Gained	73
2.10.2. Lesson Learnt	74
2.11. Conceptual Framework	74
2.12. The Research Gap	76
CHAPTER THREE.....	77
3. RESEARCH MATERIALS AND METHODOLOGY	77
3.1 Introduction	77
3.2 Research Type/ Method	77
3.3. Research Design	77
3.4. Research Approach.....	78
3.5. Research philosophy	78
3.6. Study Location.....	79
3.7. Sampling Frame	79
3.8. Target Population.....	80
3.9. Sample Size and Sampling Procedure	81
3.10. Sources of Data	82
3.11. Data Collection Techniques.....	82
3.12. Data Analysis Methods	83
3.13. Data Measurement	84
3.14. Research Instruments	84
3.14.1. Questionnaire Survey.....	84
3.14.2. Case Study Design	85
3.15. Validity and Reliability of Research Instruments	86
3.15.1 Validity of the Research Instruments	86
3.15.2 Reliability of Research Instruments	86
3.16. Ethical Consideration	87
CHAPTER FOUR	88
4. DATA ANALYSIS AND DISCUSSIONS	88
4.1 Introduction	88
4.2 Questionnaire Response Rate.....	88
4.3 The Characteristics of Respondents	89
4.4 Root Cause Factors of Poor Contract Administration	91
4.5 Impact Factors of Poor Contract Administration.....	95
4.6 Mitigation Measure Factors of Poor Contract Administration	98
4.9 Results of the case study	103
5. CONCLUSIONS AND RECOMMENDATIONS	106

5.1 Conclusions	106
5.2 Recommendations	107
5.2.1. Recommendations for the Contractors	108
5.2.2. Recommendations for the Clients	108
5.2.3. Recommendations for the Regulatory Body	109
References.....	110
6. APPENDIX A: QUESTIONNAIRE COVER LETTER.....	117
7. APPENDIX B: RESEARCH QUESTIONNAIRE	118

List of Tables

Table 2. 1 Summary of Causes of delays and cost overrun as retrieved from different literature review	39
Table 2. 2 Monitoring performance.....	57
Table 2. 3 Summary of mitigation measures against delays and cost overrun as retrieved from different literature review	59
Table 3. 1 Target Population for the Study	81
Table 3. 2 Sampling size of respondents in table form	82
Table 3. 3 Reliability Analysis of different values of Alpha Hinton et al. (2004)	87
Table 4. 1 Response rate of the study	88
Table 4. 2 Respondents Profile.....	89
Table 4. 3 Respondents' RII and Rank of Cause Factors	91
Table 4. 4 Pearson's correlation coefficient on cause factor of poor contract administration in West Arsi zone on road construction projects.....	93
Table 4. 5 Respondents' RII and Rank of Impact Factors.....	95
Table 4. 6 Pearson's correlation coefficient on impact factor of poor contract administration	97
Table 4. 7 Respondents' Combined RII and Rank of Mitigation Measure Factors based on Cost, Time and Quality Related Parameters.....	98
Table 4. 8 Pearson's correlation coefficient on impact factor of poor contract administration in West Arsi zone in road construction projects.....	102
Table 4. 9 Data of case study collected from different projects	104
Table 4. 10 Results of case study collected from different projects.....	105

List of Figures

Figure 3. 1 Research Methodology Flowchart 80

Figure 3. 2 The responsiveness rate of the questionnaire..... 85

Figure 4. 1 RII of Root cause factors of Quality, Cost and Time Related poor contract Administration..... 92

Figure 4. 2 RII and rank of cost, quality and Time Related Impact factors 96

Figure 4. 3 RII and rank of Quality, Time and Cost Mitigation Measures 99

List of Abbreviations

ERA.....	Ethiopian Roads Authority
.FDRE	Federal Democratic Republic of Ethiopia
GTP	Growth and Transformation Plan
RSDP	Road Sector Development Program
URRAP	Universal Rural Road Access Program
FIDIC	...International Federation of Consulting Engineers
POGO	Project on Government Oversight
HSSE.....	Health, safety, security, and environment
PA.....	Provisional Acceptance
FA.....	Final Acceptance
PM.....	Project Manager
VP.....	Vice President
PBC.....	Performance Based Contracting
MTID.....	Ministry of Transport and Infrastructure Development
PPA.....	Public Procurement Agency
MoWUD.....	Ministry of Works and Urban Development
GCC.....	General Conditions of Contract
FPPA.....	Federal Public Procurement Agency
GAO.....	Government Accountability Office
DOD.....	Department of Defense
MSU.....	Midwestern State University
PR.....	Project relations
WIFM.....	‘What is in it for me?’
VE.....	Value Engineering
WFP.....	World Food Program
CEO.....	chief executive officer
SB.....	strategic balancing

CHAPTER ONE

1. INTRODUCTION

1.1. Introduction over View

This study focuses on investigating causes and impacts of poor Contract Administration in road Construction: the case of West Arsi zone road construction projects; is the problem under study in this research work. This problem proposed by the researcher to study the root causes and impacts of poor contract administration in road construction projects in the location selected by the researcher. Poor contract administration covers the overall inadequate contract administration processes from contract award time to contract closing. The research focused to address the issues of poor contract administration encountered in road construction projects in West Arsi Zone.

The contents of this chapter managed with introduction, background of the study, statement of the problem, general objective which includes specific objectives, research questions, hypotheses of the research, significance and scope of the study (those written from three angles/perspectives in separate sections: thematic, spatial and temporal scopes), limitation of the study, definition of important terms and organization of the study were included sequentially.

1.2. Background of the Study

The Construction industry is one of several sectors of an economy that make tremendous contributions to the socio-monetary improvement of a country. It immediately affects the economic system of a country with the aid of presenting huge employment possibilities to unskilled, semi-skilled, and skilled sections of the society of any state and in another way through exploiting goods and services produced by other subsectors (Berk and Bicen 2017), (Sintayehu D. Kebede, Zhang T., 2021).

Road infrastructure is a crucial driving force for economic growth in any country, and sustained access to roads is essential to improve living standards (Basheka, 2012). Productivity, welfare, and security of both rural and urban people are greatly influenced by the level of road infrastructure development in any country (Arrows, 2010) (Nicholas Bankunda K., 2018)

Therefore, the road construction industry is an important part of the economic backbone in Ethiopia and shares a substantial volume of the overall construction work. According to the prevalent traditional, Design-Bid-Build mode of contract, the main players of the road construction

sector of Ethiopia comprises of the client, consultants, contractors and financiers. Generally, there are three major clients in the construction sector i.e., the public sector, developers and private owners. Accordingly, the Ethiopian Roads Authority (ERA) on behalf of the Federal Government acts as a client with the mandate of regulating the road sector. Consultants give service like designing, supervising or technical assistances. Contractors do works associated with the construction, reconstruction, upgrading, demolition, repair or renovation of a building, road, or structure, as well as services incidental to works. The main contractors participating in road construction works are public contractors like Ethiopian Road Construction Corporation, local private contractors and international contractors. The major financier in construction of road projects is the Government of Ethiopia i.e., Government Treasury and Road Fund, The World Bank, African Development Bank, the Arab Fund, Kuwait Fund and other Multilateral and Bilateral Donors. The Government of Ethiopia takes the lion share in contribution for most of the road projects under construction (George F., 2013).

The inability of the construction industry to complete the projects on time and within budget has become the major concerns of the clients. Cost overrun is a common problem worldwide, but it is a significant challenge in developing countries. The construction industry is a significant contributor of economic and social development in developed and developing countries. As the Afghanistan construction industry continues to grow in size, it even more important projects to be finished within planned budget. Unfortunately, most construction projects still fail to meet the deadlines and also exceed initial estimated budget, (Ghulam A. Niazia and Neol P., 2017).

Similarly, the studies on cost overrun also look for reasons behind the cost overrun (and corresponding benefit underperformance). Flyvbjerg et al. (2002, 2003) argues that a main problem is that planners and promoters often deliberately underestimate costs and risks and overestimate the benefits in order to increase the likelihood that their project gets approval and funding. This view is supported by other studies as well – there are political or strategic reasons for cost overrun. Similar reasons are identified by Merrow (2011) in business projects, and in addition he point to inadequate cost estimation and risk assessments. We know that there are strategic and tactical reasons for projects to experience cost overrun and benefits underperformance. These reasons need to be understood and handled well to improve PM performance, (Ole J. Klakegga, Steen L. et al., 2016).

Contract Administration refers to the management of issues that arise during the performance of a contract. Once a contract award has been made, and assuming that no significant issues presented themselves during the immediate post-award phase (i.e. the protest period), the tasks associated with ensuring appropriate contract performance begin, and are usually referred to using the generic term “contract administration”. The range and extent of contract administration activities required will vary greatly, depending primarily on the complexity, dollar value, and organizational significance of the contract. It is also important to note that effective contract administration is a shared responsibility of both contracting parties. The contract specifies the duties, obligations, and benefits that both parties are responsible for and entitled to. The contract administration function provides the oversight required to ensure that contractual promises are kept. Contract administration can be straightforward, particularly when the contracting parties are individuals or small organizations. The complexities often associated with effective contract administration tend to be more prevalent and important as the size and complexity of the contracting party's organizations increase (George A. Bartsiotas, 2014).

For Contract Administration to be effective, it is necessary to develop control procedures of contract performance which will enable the Procurement Entity to obtain value for money from the contract within the framework of the applicable law. Effective Contract Administration seeks to obtain the goods, construction works and services of the required quantity and standards of quality within the time frame and cost parameters stipulated in the contract in order to satisfy the needs of the end-user on a sustainable basis and also minimize disputes. Contract Administration requires multi-disciplinary skills which must be adequately coordinated and discharged to have a positive and progressive effect on the outcome of an impeccable tendering process. A flawed Contract Administration process will undoubtedly lead to increased costs and delay in contract completion and may also expose the contracting authority and entity to legal complications with unpredictable results (Gimpa Consultancy Services, 2018).

Poor cost performance in construction projects is a well-known element in resulting huge amount of cost overrun as faced by construction industry globally. The cost overrun is very dominant in both developed and developing countries. It affects both physical and economic development for the country and thus, it is important to ensure construction projects are completed within the estimated cost (Aftab Hameed M. and Ismail Abdul R., 2014).

1.3. Statement of the Problem

According to California department of general service, (2004) weak contract administration can cause the project to violate terms of a contract, which can lead to penalties, fines and potential lawsuits, also make projects caught up in daily routines and lose sight of contract renewals which makes projects operating under expired contracts, and makes projects in having poor reporting relationship with the contractor and leads the two parties losing benefits of monitoring, the benefits of the agreement and developing any changes to make when the agreement comes up for renewal. Each move made with a contracted entity should be dictated by the good contract management to avoid the high cost of the contract penalty clause, (Lemi T., 2022).

On the other side, poor contract administration performance is a significant cause of inefficient construction process, delays, reworks, and unnecessary variations, poor communication among team players, conflicts and disputes for both employer and contractors, (Murat G. and Hesham A. Elsherbeny, 2020).

Tadesse, Zakari, Zoubier, (2014, as cited in Zewudu, 2016 & Mengesha 2015) which argued that, regardless of its major role, the construction industry in Ethiopia, like in other developing countries, faces many challenges in its practice. Some of these challenges are project overruns, poor quality, inappropriate procurement systems, and a failure to cope with project requirements and the inability to adopt best practices. They further indicate that, the performance of construction projects against what was planned can be measured and evaluated using a large number of performance indicators that could be related to various dimensions (groups) such as time, cost, quality, client satisfaction, business performance and safety. Besides time, cost and quality are the three predominant performance evaluation dimensions and they are the three basic and most important performance indicators in construction projects. They also stated that the application of sound Project Management and Contract Administration practices provides construction project stakeholders with the means to meet their objectives, (Tsige T. Araya, 2020).

Notwithstanding its relative increase in output in the past few years, the efficiency of the construction industry of the country as a whole measured by one of conventional project success criteria of ‘timely completion’ is argued to be very poor (Solomon 2015). Previous researches established that factors of construction project inefficiencies in Ethiopia include the low capacity of contractors (in terms of capital both financial and equipment, shortage of skilled human resource

in technical, managerial, and entrepreneurial skills, etc...), the poor performances of the supply chain, inflation in the general economy and the like. However, these factors alone cannot fully capture the inefficiency of the sector; process and system-based challenges of the sector resulting from the existing legal frameworks need to be investigated. One of the factors which emanate from the existing legal framework governing public construction works that are highly intertwined with construction projects' efficiency is the mode of contracting. To successfully address the aforementioned research problem, the research raises and attempts to sequentially address two related issues. Primarily, the research attempts to explore the kind(s) of PDS(s) recognized under the laws applicable to public work contracts in Ethiopia. Secondly, it determines which mode of contracting is highly prone to construction project time overrun, (Sintayehu D. Kebede, Zhang Tiewei, 2021).

Accordingly, the researcher assumed that, in West Arsi Zone road construction many projects were also faced problems appear due to poor contract administration like cost overrun, time delay, quality issues, termination, stoppage, abandonment and rework of the projects. So that these problems were also constituting the regional government is losing large amount of money as a result of poor contract administration in road Construction projects. Therefore, this study was carried out to further assess the existence of the assumed gap and problems associated with the practice.

1.4. General objective

The general objective of this research is to investigate the causes and impacts of poor contract administration in road construction projects; the case of West Arsi Zone Road Construction projects.

1.4.1. Specific Objectives

The specific objective of this research is:

1. To identify the root causes of poor contract administration in West Arsi zone road construction projects.
2. To assess the impact of poor contract administration on the performance of road construction projects in West Arsi zone.
3. To determine the appropriate mitigation measures to improve the existing contract administration process in road construction projects in West Arsi Zone.

1.4. Research Questions

- (1) What are the root causes of poor contract administration in road construction projects in West Arsi Zone?
- (2) What is the impact of poor contract administration on the performance of road construction projects in West Arsi Zone?
- (3) How the appropriate mitigation measures introduced to improve the existing contract administration process in road construction projects in West Arsi Zone?

1.5. Hypotheses of the Research

The research is aimed to find the numerous causes that lead to a decline in the productivity of contractors in construction projects. It had been perceived that the escalation in the overall construction duration is a determining issue in the circumstance of the lowest bid (S. Deep et al, 2016). An increase in the duration of construction projects has a widespread impact on the overall cost of a construction project. In the current scenario, the retail inflation rate in the case of construction materials is very high, similarly, other factors like the quality of equipment used, and supervision from the consultant side are some of the common issues to be evaluated as part of this study, (Shumank Deep A.M.ASCE, Mohd Bilal K., et al, 2017).

HO: Null- Hypothesis

H1: Alternative Hypothesis

HO: The root causes of poor contract administration does not related to road construction projects in West Arsi Zone

H1: The root causes of poor contract administration is negatively related to road construction projects in West Arsi Zone.

HO: The impact of poor contract administration does not related to road construction projects performance in West Arsi Zone.

H1: The impact of poor contract administration is negatively related to road construction projects performance in West Arsi Zone.

HO: The appropriate mitigation measures to improve the existing contract administration process not related to in road construction projects in West Arsi Zone

H1: The appropriate mitigation measures to improve the existing contract administration process is positively related to in road construction projects in West Arsi Zone

Thus all null hypotheses has been rejected and all alternative hypotheses are accepted and taken for further analysis.

1.6 Significance of the Study

The study will help to provide the in depth sight of the causes and impacts of poor contract administration in road construction projects. It will also, identify and assess the problems encountered in poor contract administration in road construction projects and understanding learnt lessons and are very important build appropriate mitigation measures for the weaknesses based on the given recommendations. Finally, the study may benefit different stakeholders to take care and develop appropriate mitigation measures on the impacts of poor contract administrations, and it may also serve as the benchmark for further studies on the subject matter.

1.7 Scope of the study

1.7.1 Thematic Scope

This study focuses on investigating causes and impacts of poor of contract administration in road construction projects in West Arsi Zone. The investigated causes and impacts of poor contract administration were from the employer's, contractor's and regulatory body's perspective. Due to the nature of the study the focus of the primary data source was on the professional staffs of the above stakeholders who are engaged in the construction activity and have deep knowledge regarding the contract administration processes.

Currently various road projects are undertaken by West Arsi Zone Roads and Logistics Office and as well in 13 woredas' of this zone. For implementation purposes these projects are grouped and administered by the zonal road office under three different categories as: new road projects, Upgrading the existing road construction and maintenance of road projects performed and constructed by employed external constructors. The study also trying to identify root causes, assessing the impacts and determining appropriate mitigation measures of poor contract administration in road construction projects. The current study is delimited to the scope of poor contract administration of road construction projects constructed by employed external constructors which are under construction since 2012 G.C and not completed yet.

1.7.2 Spatial Scope

The following map shows the geographic boundary of the study area which is West Arsi Zone in Oromia Region of Ethiopia, named after a clan of the Oromo, who inhabit in the area. West Arsi Zone is bordered on the east and southeast by Bale Zone, on the south and southwest by the Southern Nations, Nationalities and Peoples regional State, and on the north and northwest by Arsi Zone. The capital city of the zone Shashamane is located in West Arsi Zone, Oromia Regional State about 240km south of Addis Ababa laying on the main road from Addis to Hawassa. Geographically, the area is located at 70 11' 33" N altitude and 380 35' 33" E longitude. The area has an annual average temperature ranging from 120c to 280c. The zone is sub-divided into 13 districts (woredas), namely, Adaba, Arsi-Negele, Dodola, Gadab Asasa, Kokosa, Kofale, Kore, Shala, Siraro, Shashamane, Nensebo, Heban Arsi and Wondo.

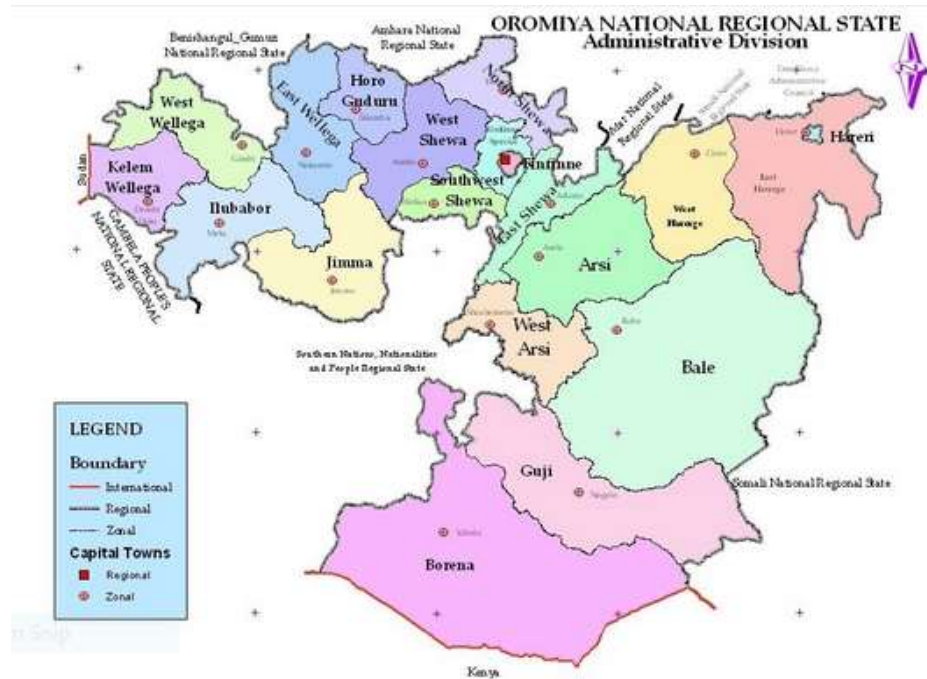


Figure 1.1 Oromia Region Administrative Division Map

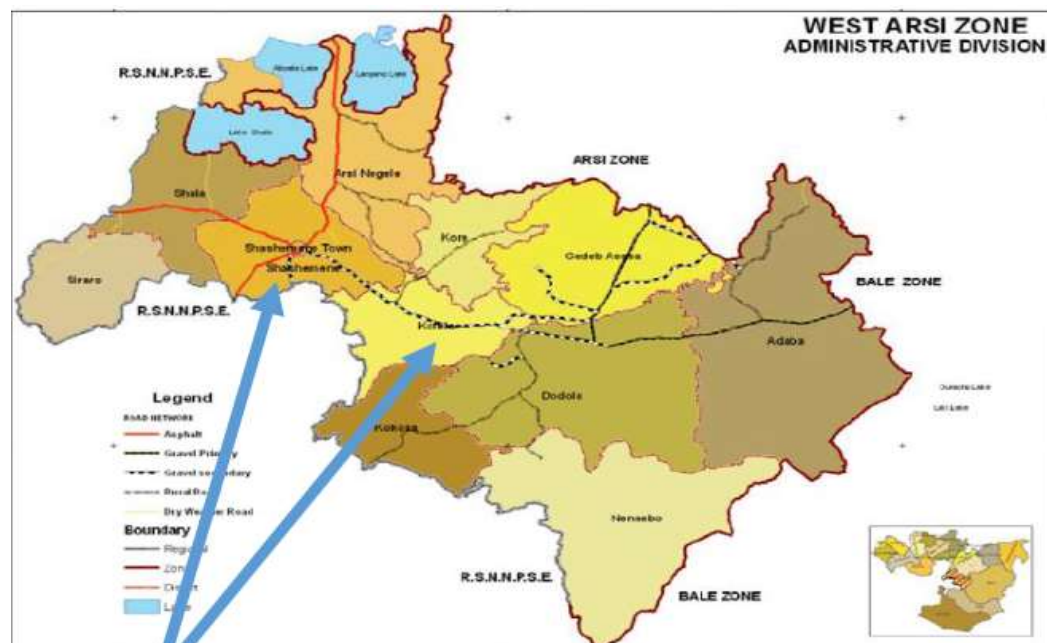


Figure 1.2 West Arsi Zone Administrative Division Map

Source: Oromia Finance and Economic Development Bureau (OFEDB) (2009).

1.7.3 Temporal Scope

The researcher has scheduled two (2) months of duration for the primary data collection from different respondents and the secondary data for the study was tried to be completed within the three (3) months length of time by reviewing from different journal articles, article in periodicals, books, book sections, reports, conference proceedings, and archival documents.

1.8 Limitation of the study

During data collection there was a problem of missing data from the prospective respondents which some of them did not return the some distributed questionnaire papers. Due to this problem the sample data filled and returned by the respondents was less than the actual sample size representing the whole population. Since the whole population was 95 which its sample size was determined by Yamen's formula as of 77 and the number of questionnaire paper prepared based on these sample size and also distributed for the respondents as well. However, some respondents about 7 in number did not return the questionnaire paper and the number of sample size reduced from 77 to 70. These less number of returned sample data for further analysis might have produce some problems on data accuracy and efficiency. To hinder back such problems; in the future other researchers need to base the same study to work on the whole sample size to end up with more accurate results. Similarly collecting questionnaires and conducting case study was a big challenge in this study. Despite the aforementioned limitations, time was also another limitation of the study since a short time schedule has been provided for the completion of the research work.

1.9 Organization and Contents of the Research

The research comprises of five chapters. Chapter one is the introductory chapter, which provides basic information about the study, including background and statement of the research problem, research objectives and scope and limitations of the research. Chapter two provides the review of the related literatures that presents theories and discussions related to the specific objectives. A brief discussion on poor contract administration is also included under this chapter. Chapter three covers the research materials and methodology followed in order to achieve the objectives of the study. It presents an overview of the research design, sources of data and research instruments, research population and sampling, sample size distributions and method of analysis. Chapter four presents analysis of the research data obtained from the questionnaire survey and the case study is discussed accordingly. The last chapter, which is chapter five, is devoted to the researcher's conclusions and recommendations.

1.10 Definition of Important Technical Terms

Construction: In the fields of architecture and civil engineering; construction is a process that consists of the building or assembling of infrastructure. Far from being a single activity, large scale of construction is a feat of human multitasking. Normally, the job is managed by a project manager and supervised by a construction, design engineer, construction engineer or project architect.

Construction Manager: is responsible for direct construction activities such as erection and installation of equipment and materials reporting to the Site Manager, and supported by construction superintendents, supervisors, and construction subcontractors. Normally, the Construction Manager is a Site Manager of a small size of construction project. (Refer to the Site Manager (or Construction Manager)).

Site Manager (or Construction Manager): is an overall responsible person for the project construction management at the construction site. The Site Manager is required to keep within the timescale and construction budget of a project, and manage any delays or problems encountered on site during a construction period. Also, responsible for the managing of the quality control, HSSE (health, safety, security, and environment), and dealing inquiries and communications with consultants, clients, engineers, inspectors, and the public for the construction activities at the site. The Site Manager ensures that drawing and materials are delivered on time and construction resources are available on the work including the construction subcontractor, construction equipment and tools, and required procedures, and construction utilities, etc. The Site Manager involves the project initiation and planning stage as a home office construction planning before site activities are commenced, and responsible for managing communications between all parties involved in the site development of the project. (Refer to the Construction Manager).

Time: In terms of Construction Contract, time means the number of days or the dates related to the construction phase that as stated in Construction Documents applies to achievement of Substantial Completion of the Work.

Quality: Quality has different meanings to different people. However, the definition of quality for construction projects is different to that of manufacturing or services industries as the product is not repetitive, but unique piece of work with specific requirements. Quality in construction project is not only the quality of product and equipment used in the construction of facility but also the

total management approach to complete the facility. Quality of construction depends mainly upon the control of construction, which is the primary responsibility of contractor.

Cost: A cost is a value of money that has been used up to produce something and hence is not available for use anymore. In business, the cost may be one of acquisition, in which case the amount of money expended to acquire it is counted as cost.

Contract: An agreement enforceable by law is a contract. It is a legal binding between two distinct parties to complete their obligations.

Contract Administration: To define contract administration in the simplest terms, it's the task of ensuring that any contractor fulfills their job to the terms and stipulations written in the contract. Contract administration is the process of planning, preparing, organizing, and executing a contract in the run-up to it getting signed. It involves understanding the core objectives of the business contract, outlining the scope of the project, and establishing what each party's obligations ought to be for the best results. It also encompasses other tasks too, like preparing contract schedules, embedding contract renewal clauses, and seeking potential vendors to work with. At a broad level, it often involves deciding what the actual terms of a contract should be and using this understanding to draft the final agreement.

Project: A project is a set of tasks that must be completed in order to arrive at a particular goal or outcome. Depending on the size and scope of the project, these tasks may be simple or elaborate, but all projects can be broken down into objectives and what needs to be done to achieve them.

Provisional Acceptance (PA): is a conditional acceptance but usually without any specific conditions or provisions in the mechanical work (Mechanical Completion (M/C)). The Provisional Acceptance means an owner has accepted the project, but the plant performance is needed to have a verification or confirmation at the actual operation conditions within an agreed period.

Final Acceptance (FA): is an owner's acceptance of the facility or project from the contractor after the entire work is completed, tested, and inspected in accordance with the contractual requirements. When the Final Acceptance is achieved, owner releases the Final Acceptance certificate to the contractor, and the plant is a permanently handed over to the owner, and confirmed by the making of final payment to the contractor.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Introduction

This chapter presents the findings from different reviewed literatures on the subjects of construction contracts, contract administration procedures, poor contract, causes and impacts of poor contract administration. The causes and impacts of any poor contract administration of road construction projects depend on the type and methods of construction, the stage of construction, the type of contract and delivery system and project type and complexity etc. Similarly the poor contract administration improvement and management technique that should be applied also depends on the above factors. Hence, the literature review tried to highlight these issues in relation to poor contract with the main focus being on contract administration of construction impacts starting from the contractual stage. It also trying to make the reviewed literatures as theoretical and empirical (related studies) review of the existing literature based on its specific objectives.

2.2. Theoretical Review

2.2.1 Construction Industry

Construction is an industry that involves complex and dynamic processes. It consists of successful coordination of multiple discrete business entities such as professionals, tradesmen, manufacturers, trade unions, investors, local authorities, specialists, trade contractors and others. Construction projects impact on a nation's economy. Successful completion of construction projects leads to wealth creation; socio-economic growth and improved standards of living. Nations are evaluated as “developed”, “developing” and “underdeveloped” based on the quantity and quality of completed construction projects in their domain. Delays in construction projects therefore impact on the economic projections of a nation. Dlakwa and Culpin found that, in Nigeria 60% of the total national investment goes into construction projects (B.P. Sunjka and U. Jacob, 2013).

2.2.2 Construction Projects

A construction project in simple words is a process of constructing something by human for one purpose or another. It may be a road, bridge, a dam, a private residence, an airport, a commercial building, office and etc. Construction is the recruitment and utilization of capital, specialized personnel, materials, and equipment on a specific site in accordance with drawings, specifications, and contract documents prepared to serve the purposes of a client. According to Moavenzdadeh F. (1976), construction contributes to the economic development of any country by satisfying some of the basic objectives of development including output generation, employment creation and income generation and re distribution; it also plays a major role in satisfying basic physical and social needs, including the production of shelter, infrastructure and consumer goods, (Gebremedhin S., 2019).

2.2.3 Road construction Projects

Road construction projects are essential components in the development of a country since they form part of the key drivers of economic growth and an important pillar towards achieving Vision 2030. It is important that the contractors accomplish projects timely, within cost and as per required quality. However, according to most road projects locally are not completed within the initial set targets of time due to a number of factors that impact negatively on the performance of these road projects for example availability of capital, management skills, organizational culture and technical skills among other factors. Road projects are complex in nature since they involve many parties. These include the Government which is a regular customer, road contractors, stakeholders, shareholders and regulators, (Yona Sakaja, 2018)

Ethiopia is making a large investment in infrastructure as one of the key contributions to the country's development plan. About 62% of the annual budget is expended on procurement for infrastructure development in transport, energy, water, agriculture, education, health and other sectors (Quinot & Arrowsmith, 2013). This comprises about 15% of the GDP of the country. Transport alone constitutes 30% of the annual budget expenditure. For example, the Ethiopian Roads Authority signs a large number of contracts annually committing over ETB 29 billion. However, Ethiopian Public Procurement system has so far been characterized by the traditional procurement approach (World Bank & Ethiopian Government, 2010), considering price as a main evaluation criterion. Using least cost approach as evaluation criteria avoids having to make

judgments on qualitative aspects of bids, thus eliminating one opportunity to bias in the selection process. This, however, results in nothing but buying inferior quality products or works, project performance delays and cost overruns in Ethiopia (Quinot & Arrowsmith, 2013). All of these procurement risks are mostly left to the public buyer once the goods are supplied. Of course, suppliers/contractors have paid for the activities but not for the results achieved (Patil & Molenaar, 2011). These all encourages us to empirically prove the public procurement practice of Ethiopia. The results of this empirical study help the procuring entities to understand the concepts of PBC approach and make use it as a valuable contracting option. One of the reasons for this is that the traditional procurement system does not grant any motivation scheme for the contractors to innovate new ideas, to enhance efficiency, and to reduce the cost and time required for the contract (Shen, 2003). Rather, they intentionally delay the project performance time to enable them to request additional costs in the form of price escalation (Baynesagn Asfaw A. and Jan T., 2017).

2.2.4. Contract Definitions

A “contract” is a legally enforceable agreement – an exchange of promises for which the law can provide a remedy if the promises are not kept. It may be an agreement to pay something, to do something, to not do something, to give or receive something, or to warrant something. A contract may be written down, or it may be verbally agreed; it may be a formal document that is negotiated over many months, or it may arise via an exchange of emails or even a handshake. There are specific legal principles that determine whether a promise or undertaking will be legally enforceable, and those principles apply equally regardless of the name or label given to the arrangement (e.g., “contract”, “agreement”, “memorandum of understanding”) (The University of Adelaide, 2007).

A contract is a legally binding agreement between two or more parties to exchange something of value. In construction, it is usually money in exchange for construction services to build a facility. A contract imposes on both parties contractual and legal obligations that are difficult or impossible to change (Thomas and Ellis, 2007). Conditions of contract define the basic rights, responsibilities, and relationship of the parties involved or the rules by which each party must comply. Conditions of contract mostly consist of: General Conditions & supplementary conditions. General conditions contain general clauses that establish how the project is administered and are intended to be used

unchanged for every project. It is usually in the form of published standard document that include written principals common to most construction contracts, (Lemi Teferi, 2022).

The contract strategy is an important element in a construction project. The contract strategy should describe how to ensure appropriate competition in the selection phase, how to allocate tasks, responsibilities and uncertainties, and which contractual instruments should be established to support governance during the implementation phase. Most large client organizations have a general, overall strategy for contracts, which in turn provides the premises for the contract strategy for the individual projects. The purpose of the contract strategy is to achieve the best possible value for money in the contracts, considering the market situation, the characteristics of the contract, and the maturity of the plans, as well as the client's expertise and capacity. The contract strategy can have major impacts on the timescale and cost of projects, and therefore the choice of contract is important when making investment decisions, (Morten Welde and Roy Endre Dahl, 2021).

Contract of public works: A contract of public works is a contract whereby a person, the contractor, binds himself in favor of an administrative authority to construct, maintain or repair a public work in consideration of a price. Where the contract only relates to the supply of materials for the purpose of carrying out a public work and the supplier himself takes no part in the carrying out of the work; the Contract shall not be one of public works but one of supplies, (Civil Code of Ethiopia, Art. 3244 (1) and (2)).

2.2.5. Construction Stakeholders

2.2.5.1. The Contractor

Regular progress reviews will be prepared through the Contractor and submitted to the Engineer in six copies. Reporting shall preserve till the Contractor has completed all project which is understood to be excellent at the accomplishment date stated inside the Taking-Over certificate for the Works.

Every report shall include: Charts and detailed descriptions of progress, including each stage of design photographs showing the status of manufacture and of progress on the Site for the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress copies of quality assurance documents, test results and certificates of Materials, (Bogdan Oprea, 2015).

2.2.5.2. The Project Manager

The Project Manager (PM) is the individual charged with responsibility for the complete and satisfactory execution of the entire project. In very large organizations divided into regional areas, the PM may report to an executive or other person who would in turn report to the Operations VP. In most companies, however, the PM reports directly to the Operations VP or to the company President. In many small companies, the PM may be the Operations VP or the President. In any case, the Project Manager is the company representative who deals with the outside world (owner, design professionals, vendors). His or her actions, as such, will be regarded as the company's. However good or bad that person appears to be, the company itself appears to be.

General duties of the Project Manager include:

- Assisting in development of the project staff
- Coordinating on-site with corporate office activities
- Organizing and overseeing jobsite administration
- Organizing and coordinating field supervision
- Assisting in the procurement of subcontractors and suppliers
- Developing, monitoring, updating, and communicating the progress schedule and its periodic revisions
- Managing the direct labor force and maintaining labor relations
- Managing subcontractor schedules, quality of work, coordination with other trades, and payments
- Coordinating cost-progress targets with production
- Creating and maintaining a safe/secure jobsite environment
- Identifying and resolving all changes
- Establishing and maintaining relationships with the Owner, design professionals, building officials, local businesses, and police and fire departments.

2.2.5.3. The Superintendent

The Superintendent is responsible for the supervision of all field activities related to the physical construction. He or she reports to, and carries out the direction of, the Project Manager with respect to field operations, and thereby directs the daily progress of the work. The jobsite workforce is made up of an army of specialists. The Superintendent must ensure that the combination of their components results in a cohesive product that achieves the required quality and is completed in the shortest possible time. To that end, the Superintendent must continually work to ensure adequate staffing of the workforce, sufficient supply of materials, and complete information as necessary to assemble the product, and must plan for all these things enough in advance so as not to interfere with the progress of any one component.

General duties of the Superintendent include:

- Generating, securing, or otherwise confirming all information needed to create, monitor, and modify the progress schedule on a continuing basis
- Developing the progress schedule with the Project Manager
- Participating in scope reviews of the various bid packages to properly coordinate their respective interfaces and ensure that nothing is either left out or bought twice
- Working with the Project Manager to develop and administer the site utilization program, site services, security arrangements, and other facilities and arrangements necessary for appropriate service to the construction effort
- Identifying field-construction and work-sequence considerations when finalizing bid package purchases
- Monitoring actual versus required performance by all parties
- Determining whether subcontractors are providing sufficient workforce and hours of work to achieve performance commitments
- Monitoring the performance of the company's Purchasing and Project Engineering functions to ensure that all subcontracts, material purchases, submittals, deliveries, clarifications, and changes are processed in time to guarantee jobsite arrival by, or before, the times needed
- Directing any company field staff

- Being thoroughly familiar with the requirements of the general contract, thereby identifying changes, conflicts, etc., that are beyond the scope of responsibility
- Preparing daily reports, job diaries, narratives, and all other regular and special documentation as determined by the company and by the project needs.

2.2.5.4. The Project Engineer

As the Superintendent manages the physical construction of the project in the field, the Project Engineer in a sense builds it first-on paper. The Project Engineer is responsible for coordinating the complete construction and administrative requirements of the various bid packages; organizing the complexities into a management system that will establish, monitor, and follow up on each vendor's compliance; and orchestrating the information flows needed for each component and system to be incorporated into the project; all within the time frames needed by the progress schedule. Strict attention to detail, a profound appreciation for time constraints, and a sober understanding of the dividends reaped through proper documentation all add up to an effective Project Engineer.

Duties include:

- Working with the Project Manager, Superintendent, and the estimating/ purchasing effort in the final development of the various bid packages and the baseline construction schedule
- Working with the Project Manager and Superintendent to develop site utilization programs
- Establishing, maintaining, conducting, and policing detailed procedures for the submittal, review, coordination, approval, and distribution of shop drawings, samples, etc.
- Establishing and maintaining all project engineering files relating to subcontract and bid package records, plans, specifications, changes, clarifications, and as-built documents
- Reviewing all vendor schedules of values and preparing the general schedule of values as coordinated with the Project Manager
- Managing the periodic requisition procedure for review, submittal, and payment

- Expediting vendor estimates and proposals and preparing appropriate company estimates and proposals for changes to be submitted to the Owner
- Determining appropriateness and preparing subcontractor change orders to be processed through the Project Manager
- Evaluating subcontractor payment requisitions relative to actual work performed
- Working with the Project Manager, Superintendent, and Project Accountant to prepare the general requisition and follow it through to payment, (Sidney M. et al, nd).

2.2.6. Construction Contracts

Construction contracts are tools for specifying the rights and duties of stakeholders as well as stating the intentions of the parties. There are various activities in construction projects including installation, repair, demolition and construction. The activities and stakeholders affect construction projects. It is difficult to integrate the components because the relationships among the stakeholders as well as scopes of works are unclear. In the United Kingdom, the stakeholders were divided into five groups: constructors, designers, lawyers, employers and users. However, decision making is difficult because the duties of each group are unclear. Hence, the construction flexibility and criteria were required, (Research India Publications, 2017).

According to Mwanaumo, Muya, Matakala, Mwiya, Kaliba and Sanga (2011), a construction contract is a legally binding agreement between two parties on the details and cost of a construction project. This type of contract covers very expensive, complex projects and simple renovations. There are two types of clients that use construction contracts: residential and commercial. Each client has different requirements that determine what is included in the contract (Mwanaumo, Muya, Matakala, Mwiya, Kaliba and Sanga, 2011). Administration is the management of the affairs of a contractor's business. Site administration is the management of the contractor's affairs on a particular construction site (Mwanaumo, et al., 2011). Site administration and site management is often under - resourced and neglected in favour of production pressures. Site administration and site management is the 'nerve centre' of operations and if these functions are not functioning effectively, they will hamper production output and quality will suffer. Good contract administration is required to manage design specification, contractual agreement, competitive tendering, evaluation, cost control, variations, final accounts, claims and even

disputes; this will eventually help to reduce construction costs (Mwanaumo, et. al., 2011), (William Akoto Oppong, 2019).

2.2.7. Types of Construction Contracts

According to Article 2610 of Ethiopia civil code, a construction contract as “a contract of work and labor is a contract whereby one party, the contractor, undertakes to produce a given result, under his own responsibility, in consideration of a remuneration that the other party, the client, undertakes to pay him”. There are many different types of construction contracts, distinguished primarily by the method of determining the final contract price. The type of contract chosen may depend on several factors, including the identity and relationship of the owner and contractor (if any); the completeness of the design and its complexity; the type of work being done; and the need or desire for competitive pricing. Construction contract broadly classified as (1) Fixed-Price Contracts, (2) Cost-Reimbursable Contracts, and (3) Guaranteed Maximum Price Contracts. The details of each construction contracts are presented below.

2.2.7.1 Fixed-price Contracts Fixed-Price

Contracts categorized as (i) Lump Sum Contract, (ii) Unit-Price Contract (Measured contract), and (iii) Fixed-Price Incentive Contracts. The details of each type of fixed-price contracts are as presented below.

2.2.7.1.1 Lump Sum Contract

Lump Sum Contract is one form of Fixed-Price Contract in which the contractor agrees to do specified construction for a fixed price set forth in the contract. The only changes allowed to the fixed price are for extras or change orders. It is commonly used in small scale irrigation works contract in conjunction with Unit-Price Contract (Measured Contract).

2.2.7.1.2 Unit-price Contract

Unit-Price Contract is another form of Fixed-Price Contract in which it sets for the price for each unit of works constructed. The unit may be, for example, a square meter of clearing, a cubic meter of excavation, a cubic meter of masonry, a cubic meter of concrete. The contract may specify a particular number of units needed. For example, if the contract is for excavation, it might state that the excavator will be paid 45 ETB per cubic meter of normal soil excavated to a depth not exceeding 150cm from the site. Anything can be measured in units can be the basis of a unit-price contract. Unit-Price Contract can be called Measured Contract. Unit-Price Contracts or Measured

Contracts are most often used in small scale irrigation construction contracts, such as earthworks, masonry works, concrete works, pipelines, and other activities where it is difficult to calculate actual quantities in advance.

2.2.7.1.3 Fixed-price Incentive Contract

Fixed-price incentive contract is a fixed-price contract that provides for adjusting profit and establishing a final contract price by application of a formula based on the relationship of total final negotiated cost to total target cost. The final price may be subject to a price ceiling, negotiated at the time of entering into contract. The concept can be structure in either of two forms, example, firm target price or successive target prices. A fixed-price incentive contract is appropriate when a firm-price contract is not suitable.

2.2.7.2 Cost-reimbursable Contracts

Cost-reimbursable contracts are cost-plus contracts in which the contractor is paid its actual costs of the construction plus a specified markup to cover overhead and profit. Typically, the contract defines costs including all expenses incurred in the construction, including expenses for materials, wages for labor, temporary facilities, and subcontractors and suppliers. The contract may specifies what not eligible costs for reimbursement purposes are. Cost-plus contracts are appropriate where, due to an incomplete or very complex design, a contractor would be unable to give a lump-sum price without including a large contingency for unknown factors. Cost-Reimbursable Contracts comprises (a) Time and Materials or Cost-Plus-Percentage-of-cost, (b) Cost-plus-Fixed-Fee, and (c) Cost-Plus-Incentive-Fee. The details of each type of cost reimbursable contracts are as presented below, (MINISTRY OF AGRICULTURE, ETHIOPIA, 2018).

2.2.8. Road construction Contract

A construction contract is a binding agreement, enforceable in law, containing the conditions under which the construction of a facility will take place. According to Ostwald (2001), the element of risk, the willingness of the parties, the competition, complexity of construction, and urgency may influence the general type of contract selected. Construction contract types have direct impact on the cost estimation of construction projects. Similarly, the contract type of a project also has a direct impact on the compensation in case of price fluctuation (Tadesse, 2006 in Asteway, 2008), (Mohammed G. Mossa, 2013).

2.3. Contract Documents

The formal contract documents are the basis for the administration of a contract and only the specific requirements of those documents can be used in establishing the rights and obligations of both parties to the Contract. All personnel involved in administration of the Contract must ensure that both the Employer and the Contractor receive fair and equitable treatment, (Revision 1, Junior George, Acting Director, 2018.)

2.3.1. Priority of documents

The documents forming the Contracts are to be taken as mutually explanatory to one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

- The Contract Agreements (if any)
- The Letter of Acceptance
- The Letter of Tender
- The Particular Conditions
- These General Conditions
- The Specifications
- The Drawings, and
- The Schedules and any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any clarifications or instructions, (FIDIC, 1999).

2.4. Acceptance of Works

2.4.1. Provisional Acceptance of Works

A provisional acceptance is a joint ascertainment of the works made immediately after the completion of the works. A provisional acceptance shall result from the effective taking of possession, where this has been made under reservation, (Civil Code of Ethiopia, Art. 3274 (1) and (2)).

A provisional acceptance shall not exonerate the contractor from any defect which may appear after it is made. It shall amount to a tacit acceptance of the modifications which the contractor may

have made in the project. It shall mark the beginning of the period of warranty at the expiration of which the final acceptance shall be made, (Civil Code of Ethiopia, Art. 3275 (1), (2) and (3)).

2.4.2. Final Acceptance

The final acceptance is the act whereby the administrative authorities definitively appropriate the works after having ascertained that the contractor has performed his obligations in their entirety. It shall be made jointly and a record shall be drawn up, (Civil Code of Ethiopia, Art. 3276 (1), (2) and (3)).

2.5. Contract Administration Definitions

“Contract administration” is a term used to describe the functions that are performed after the parties have signed the contract (Sherman, 1996). As a precise term, contract administration refers to those activities that take place after contract award and can encompass a plethora of activities ranging from routine to unusual. Typical contract administration activities are goal oriented, aimed at ensuring enforcement of the contract terms and conditions while giving attention to the achievement of the stated output and outcome of the contract. In other words, contract administration is about much more than simply the enforcement of the contract language. It requires the contract manager to remain focused on the program goals and objectives, (Macrothink Institute, 2009)

Contract administration as a set of activities performed by government officials (client’s representatives) after a contract has been awarded to determine how well the government (client) and the contractor perform to meet the requirements of the contract.

Contract administration encompasses all dealings between the government and the contractor from the time the contract is awarded until the work has been completed and accepted or the contract terminated, payment has been made, and disputes have been resolved, (Robert Agwot Komachek, 2018)

Different studies have discussed the causes for poor contract management for works including; those contracts were not properly signed in some cases, some contracts lacked important documents such as conditions of contracts, drawings and specifications and some contained non-contract documents such as invitation for bids, liquidated damages were not applied for delayed contracts, and site meetings were not conducted, (Samwel Marco, 2013)

Thai, (2003) Furthermore, it is noted that progress report for works were not prepared, extension of time were issued without justifiable analysis, payment certificates were not attached with necessary information such as measurement sheets to justify the quantities paid and in some cases payments were made for works which had not been done by exaggerating the quantities. This initial perception fails to take into account other factors for poor contract management like poor preparation of contract documents, Corruption practices, lack of enough communication between the key players in the implementation of the contract and; lack of practical legal technicalities on managing contracts, disregarding specialization and/or professional practice on the use of skilled personnel in contract management are also factors to consider when discussing about the factors for poor contract management. If we continue to believe on the raised factors on other conducted studies without considering the contribution of new factors under research, the trouble of poor contract management will continue to be the common practice in public sector, which may lead to poor social-economics and political development in Tanzania (Samwel Marco, 2013).

Contract administration is usually the responsibility of an individual designated by the borrower, or may be carried out by expert project implementation consultants engaged by, and under the direction and oversight of, the borrower, especially for large, complex projects. Contract administration typically involves the Records management, including setting up and operating a records management system to record correspondence, claims, meeting minutes, performance reviews and other records; Managing and tracking of payments to the contractor against invoices and/or claims and the timeliness thereof; Managing performance; Conducting review meetings; Managing changes, i.e. variations and projected costs against budget; and Managing disputes, (Gimpa Consultancy Services, 2018).

Contract administration covers the formal governance of the contract and any permitted changes to documentation during the life of the contract. This area of contract management ensures that the everyday aspects of making the contract run effectively and efficiently are taken care of, (Asian Development Bank, 2018)

Contract administration starts at contract award and continues throughout the contract implementation period. It refers to the management of the day-to-day practicalities and administrative requirements under the contract. It makes up the bulk of contract management activities. Contract administration is affected by what has occurred earlier in the project

(comprehensiveness of project documents, choice of contract, formulation of project teams, robust shortlisting and tender, etc.); therefore, the borrower's team must have contract management in mind from the start of project design and processing. Contract administration is usually the responsibility of an individual designated by the borrower, or may be carried out by expert project implementation consultants engaged by, and under the direction and oversight of, the borrower, especially for large, complex projects, (OECD and EU: Public Procurement (Brief 22),, 2011)

An effective contract supervision and control can be achieved if all the parties involved aim to work together. Co-operation, collaboration and coordination irrespective of any differences of opinion and personality are essential. The supervision organization must be provided with offices, laboratories, equipment and transport facilities to be operational. Supervision is the responsibility of the Engineer and his/her primary duties are to direct the execution, completion and maintenance of the Works and to test and examine materials and workmanship, (George F., 2013).

Transforming from the traditional contracting system to PBC entails the introduction of significant differences in the contracting process (Hypko et al., 2010). It involves changes in the basic role of the contracting parties in the contracting system, the assumptions on which the contract is based, the incentive schemes the contract is designed to award and the expectations from the contract (Hypko et al., 2010). The traditional contracting system specifies how the contractor should perform the contract (Boykin, 2005), whereas PBC defines only what results the contractor should achieve, leaving the contractor more flexibility to determine the best way to achieve the results expected by the buyer (Van Mossel & Van der Valk, 2008). In contrary to the traditional approach, PBC is believed to encourage creativity and innovation by allowing contractors to decide on their own how to perform the task to achieve the expected results (Rosenthal, Fernandopulle, Ryu Song, & Landon, 2004). Scholars agreed that when the contractors are free to choose how to perform the contract, but provided with clearly defined expected performance targets, they can design new ideas to fulfill the contract with reduced cost and time (Johnson & Medcof, 2007; Lawther & Martin, 2005) (Baynesagn Asfaw A. and Jan T., 2017).

2.6. Poor Contract Administration in Road Construction Projects

Poor contract administration performance is evident in the scenario where parties claim what they are not entitled to, or do not get paid for what they are entitled to, and someone gets short-paid.

False claims cost the tax payer millions of dollars each year, and efforts by Project on Government Oversight (POGO) help to expose this unethical practice (POGO, n.d.). POGO provides such data aimed at exposing the practice, and increasing awareness on the consequences of false claims (George O. Okere, 2012).

Poor documentation is the greatest source of claims and disputes in the construction industry (Contract Control International Pty Ltd 2015). RCCs are made up of several documents that are provided by the Principal, in this case TMR, to selected Contractor's to tender for the work, (Alan G., Purvis, 2015).

2.6.1 Identifying Root Causes of Poor Contract Administration in Road Construction

Poor Supervision: Inadequate supervision always lead to poor supervision and the consequence is always poor project delivery. This normally occur due to inadequate training given to labourers used in construction sites as it is seen in Nigeria construction industry that there are thousands of labourers works directly and indirectly in which most of them are unqualified, unskilled, and untrained, (Sulaiman E. Abdullahi A.A., et al, 2020).

Non-performance of Contract: A declaration to the effect that a contract of public works shall come Under State control may be made where the contractor fails to perform his obligations. Notwithstanding any provision to the contrary, the administrative authorities may declare the placing Under State Control not less than ten days after having summoned the contractor to perform his obligations. The placing Under State control may affect only a part of the works, where the Undertaking permits a partial Control, (Civil Code of Ethiopia, Art. 3288 (1) and (2)).

Lack of Funds to Finance the Project to Completion: The cost overrun is an important measure of project failure. Insufficient funds released have stalled many projects not allowing it to reach completion. This is evidenced in most parts of the country that failed and abandoned projects littered everywhere. This problem may arise from either the clients (e.g Federal Government, State Government, Private Individuals) or the contractors (i.e construction companies). Research showed that some of the contractors even disappeared despite funds were released to initiate the project execution. According to Mukeshchandra et al. (2018), construction industry requires huge capital to build an infrastructure and technological advancement also needs to be updated. Ibrahim (2019) reported that Commissioner for Education in Kaduna State, Dr. Shehu Makarfi, disclosed at a meeting with some of the contractors on the problems affecting execution of the projects. A

government document shows that the projects awarded at the cost of over N6.35bn were mainly construction, renovation, and rehabilitation of classrooms. Others are the construction of drainage system, solar-powered boreholes, toilets, supply and installation of solar streetlights, supply of furniture, as well as construction of perimeter fences. The Commissioner said the percentage of completion of the projects range from 0 to 80 percent, and that only four of the projects were 100 percent completed, adding that this was despite about N 2.31bn so far disbursed to the contractors. He said the state government had concluded plans to pay outstanding contract liabilities, but noted that some of the contractors were not doing very well while others just collected mobilization fee and disappeared. According to Ajobe and Sule (2019), this lack of fund had led to the abandonment of Baro Inland Port before the Buhari Administration forged ahead to deliver it. The contractor returned to site after an initial release of fund by the Buhari administration but the progress has been slow due to failure to advance additional fund for the project, (Sulaiman E. Abdullahi A.A., et al, 2020).

Disputes in Construction Projects: Disputes in the construction projects occur at three phases: design phase, contract phase, and construction phase. Design phase disputes occur due to incomplete, inaccurate, inconsistent, and uncoordinated civil, structural, electrical, and mechanical details and design specifications which can result in unexpected change orders. Contract phase disputes occur due to misunderstanding and lack of appropriate agreement between the client and the contractor on the type of contract or other variations in the scope, time, and cost. Construction phase disputes occur due to unforeseen site conditions, access to utilities, weather, and other working conditions. Causes or sources of disputes may be different in different countries, organizations, and projects, but by large, these are of similar nature with varying order of their importance and frequency of use. Contributors of disputes may also be different in different contexts and play an important role in dispute creation. Impacts of disputes may be varied from country to country depending on the context, but potential impacts influence the construction projects performance negatively everywhere. The dispute resolution approaches may be slightly varied depending on the country's law and system, but the frequency of their use and effectiveness may be largely different in different contexts, (Faisal I.Malik and Amanat Ali, 2019).

2.6.2. Assessing the Impact of Poor Contract Administration in Road Construction Projects

2.6.2.1. Factors Affecting Time (Duration) In Road Construction Project

Project schedule is a tool that communicates what work needs to be performed, which resources of an organization will perform the work and timeframes in which that work needs to be performed. Project schedule should reflect all of the work associated with delivering the project on time (Gaba, 2013). (Henry et. al. 2007) asserted that various factors have been identified by different researchers from the time aspect indifferent construction industries. Lack of materials, incomplete drawing, incompetent supervisors, lack of tool and equipment, absenteeism, poor communication, poor site layout, inspection delay and rework were found to be the most significant problems affecting project duration (time). (Olomolaiye et al. 1998) have identified five most significant factors affecting time management in the Nigerian construction industry. They are lack of materials, rework, equipment, supervision delays, absenteeism and interface. Lack of material, weather, and physical site conditions, lack of proper tool and equipment, design, drawing and change orders inspection delay, absenteeism, safety, improper plan of work, repetitive work, changing crew size and labour turnover were found to be the most critical factors in Iran (Henry et. al., 2007).

2.6.2.2. Factors Affecting Cost in Road Construction Project

Project cost is the total project cost which includes design fees, material costs, and construction costs, permit fees, land, furnishings, financing and all other costs that are incurred in completing a project. The ability to accurately predict the client's financial commitment to a project, which also forms the basis of the contractor's eventual revenue, has many advantageous implications. As a pre-warning indicator, alternative courses of actions can be examined and provision can be made for the preferred option. The client according to (Ibironke, 2003) has the capital and related interests to consider often with no prospect of a financial return until full completion of the project. The factors identified by contractors affecting cost and time in a survey carried out by (Mansfield et al. 1994) include the following: price fluctuation, inaccurate estimates, delay (time overrun), additional work, fraudulent practice and kickbacks, shortening of contract period, construction method, poor contract management, subcontractors and nominated suppliers, mistake during construction and non-adherence to contract condition.

2.6.2.3. Factors Affecting Quality in Road Construction Projects

Quality is the summation of the following characteristics, right first time, value for money, customer satisfaction, and consistent conformance to specification (Ameh et al.2002). Excellence, conformance to standards or specifications, and fitness for purpose has all been criticized as definitions of quality (Dotchin, & Oakland, 1993). Customers typically define quality as value or fitness for use, which involves expectations the customer has for the product (Garvin, 1983) Construction production quality is the degree to which the production meets the requirements and methodology stated in the design and specifications. The requirements refer to the needs or expectations of the client/promoters and the methodology implies execution of construction in conformity with the approved design, drawings and specifications (Chitkara, 2011). The first step in quality as defined by (Bamisile, 2004) is the definition of customer's needs and expectations which must be translated into clearly defined and measurable requirements for building construction projects. He drew attention to the fact that good design embraces such things as getting a proper brief, ensuring the design matches the client requirement, prescribing the best material for the job and making sure that what is inked in the drawing can be built on the site. He also argued that only the contractor has the responsibility and power to achieve specified standard. Experience suggests that the contractor's inspection and control arrangement are rarely sufficient for any contract. Casual inspection methods are not likely to be effective and could leave a large section of defective work until when it becomes unreasonable to remove them. The various steps that should be followed in order to achieve specified quality standard at first attempt are often not adhere to by the project team. Such steps are construction methodology, construction programmes, site layout, plant and equipment analysis etc. (Mosisa D., 2022)

2.6.3. Determining Appropriate Mitigation Measures of Poor Contract Administration in Road Construction Projects

2.6.3.1. Contract monitoring and performance

Contract formation is a series of pre-award procurement activities between client and a contractor that results in a contract. Excellence in contract monitoring during the contract formation or pre-solicitation phase begins with specifying the need, establishing contract goals, identifying potential risk when using procurement tools to develop specifications and a contract that effectively addresses the established objectives. Components that make up the presolicitation process include the pre-award orientation or pre-meeting with applicable program and contracting officials prior

to the post award orientation conference so that there is a clear understanding of their specific responsibilities and restrictions in administering the contract. The time spent on contract formation will reduce the amount of time spent administering contracts. It will also aid in the development of a plan for monitoring contract performance (Wu et al., 2014). Contract monitoring points include, but are not limited to: deliverables, timetables, payment triggers, quality of deliverables and the information and reports the vendor must produce so performance can be monitored. The contract cannot be properly monitored and enforced unless these points are incorporated into the contract at contract formation. Tracking the performance of the contractor is the principal function of proper contract monitoring and administration. The purpose is to ensure that the contractor is performing all duties in accordance with the contract and the client to be aware of and address any problems or issues promptly. Not every contract will require the same level of monitoring. All contracts should be reviewed periodically within the contract term taking into account size or contract value, associated risk, sensitivity (contracts receiving high volume of public scrutiny), and type of contract and services being provided. Small value or less complex contracts may require minimum monitoring. However, that does not preclude the possibility of more detailed monitoring if deemed necessary. Conversely, large contracts may not require extensive monitoring if the items or services purchased are not complex and client is comfortable with the contractor's performance and the level of risk associated with the contract. When assessing risks to determine the level of monitoring, the identified risks should be linked to the monitoring plan. This function is separate from, but closely related to, the role of project manager. Typically, a project manager plans and organizes those resources required by one or more parties to a project, and coordinating use of those resources, as needed, for completion of the project. More complex projects may involve multiple contracts, and simple projects may not have a separate project manager assigned (Bartsiotas, 2014), (Charles Harerimana, 2021).

2.6.3.2 Contractor Regulation Practices and Performance

Building guidelines are statutory units that are seeking for to make sure that the constructing guidelines set out within the relevant rules are completed. In constructing, law includes registration of contractors, initiatives, skilled construction workers, production website online supervisors, education establishments, and provisions referring to series and price of the construction levy (G.O.K, 2012). Umeokafor, Umeadi and Jones (2014) reviewed the compliance with occupational safety and health regulations in Nigeria's construction industry. Results showed that key issues to

compliance with occupational safety and health regulations in the Nigerian construction industry include: client's influence, inadequate enforcement (which ranked highest), lack of adequate regulations and unemployment, which ranked lowest. There are various ways regulators intervene in the construction industry. The construction regulation authorities cast off corruption instances within the constructing industry, emphasize on each cloth exceptional and contractor overall performance, and revise the constructing codes to make certain relevance (Nahinja, 2014). In line with Mohammed (2010), construction guidelines need to contain a provision that the contractor who plans to carry out any creation shall earlier than sporting the paintings notify in writing the in a position authority for construction making plans, (Ochola L. Salome, 2018).

2.6.3.2 Contract Supervision Practices

A study by Bhardwaj (2011) on the Ministry of Transport and Infrastructure Development (MTID) reports on collapsed structures apportion the blame to lack of proper supervision and poor construction procedures (MTID, 2016). Wambugu, (2013) concluded that insufficient supervision and inspection of work in construction project led to rework in times of poor workmanship and this caused delay in assignment well timed of entirety. This also ends in venture price overrun and may end result to project abandonment. Insufficient site inspection is one of the elements recognized as causing undertaking delays 16 in well-timed completions. Githenya and Ngugi (2014) on implementation of housing projects in Kenya and underscored the need to supervise contractor especially on competency of contractors. The study aim was to assess project planning, project control, motivated project team and project management competency, on housing project implementation in Kenya. It was found out that that project planning, project control, motivated project team and project management competency have a great influence on housing project implementation in Kenya. Project Control measures was found to be the most significant with correlation coefficient of 76.6percent element influencing implementation housing projects in Kenya. Ayuba, Olagunju and Akande (2011) assert that the higher the percentage of clay and silt content in sand used in concrete production, the lower the compressive strength of the hardened concrete. Fawehinmi (2012) investigated quantity surveyors' perception of construction health and safety regulation in Nigeria. Results showed that construction health and safety was still perceived to be more important than the traditional project parameters in the form of cost and quality, (Ochola L. Salome, 2018).

2.7. Empirical Review

2.7.1. Identifying Root Causes of Poor Contract Administration in Road Construction

Poor performance here can be devastating. For example, inaccurate payment applications or delayed information attainment will cause havoc with the entire construction process. The work flow will suffer and affect both the schedule and the budget. That of course puts the entire project at risk. So, you can see how important the contract administration function is to the overall project success even though it has very little to do with the actual bricks and sticks of building, (Jackson 2004). Maintaining compliance with the contract's mountain of paperwork and bureaucracy is a serious task that should not be underestimated. One of the biggest causes of project problems is ineffective contract management procedures. And if a lawsuit arises over the project, the party with the best-organized management practices will typically prevail. The contractor is obligated to provide excellent administrative practices training to all of his management staff (Jackson 2004), (Yehyes D., 2021).

Cost management system is a process that should be carried out throughout the lifecycle of a project, from the inception to the final completion and final payment to the contractor. In the light of this, the timelines and cost effectiveness of various operations and decisions carried out will determine to an extent the magnitude of cost that could be saved on the project. This study aims at identifying and examining the factors responsible for cost escalation, (A. Nazif, A. K. Mustapha, et al., 2020).

A number of studies have been carried out to identify the cause of delay in construction projects. Assaf and Al Hejji (2006) conducted a time performance survey of different types of construction projects in Saudi Arabia to determine the causes of delay and their importance according to each project participant (owner, consultant, and contractor). They identified seventy-three (73) causes of delay during the research. The common causes of delay identified by all parties were "change order, (Nesru Serani D., and Tadele Wodaje B., 2020)."

Factor analysis and regression modelling were employed to study the implication of the delay factor. From the factor analysis, seven (7) critical factors of construction delay identified these are lack of commitment, communication and clarity in project scope, inefficient site management, improper planning, poor site coordination and substandard contracts. The regression model specified slow owner decision making, poor labour productivity, reluctance, rework due to

mistakes were significantly affect the overall delay of the project, (Nesru Serani D., and Tadele Wodaje B., 2020) .

2.7.1.1. Causing Factors to Road Construction Projects Based on Cost Performance

"Cost" means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit, (Bogdan Oprea, 2015).

Occurrences of poor cost performance in construction projects are due to various factors. These inhibiting factors are referred to as cost overrun factors by many researchers. Literature reviewed on Kaming et al. work indicates that major factors affecting project cost in high-rise building projects are materials cost increased by inflation, inaccurate quantity take-off, labour cost increased due to environment restriction, lack of experience on project location, lack of experience of project type, unpredictable weather conditions, and lack of experience of local regulation. In Chang study, two reasons for cost increase in engineering design projects are owner request of changes in scope and additional works. While in Koushki et al. study on private residential projects, the main contributors' factors are contractor-related problems, material-related problems, and owners' financial constraints, Enshassi et al. studied construction projects specifying that main factors are increment of materials prices, delay in construction, supply of raw materials and equipment by contractors, fluctuations in the cost of building materials, unsettlement of local currency, project materials monopoly by some suppliers, resources constraint(funds and associated auxiliaries, not ready), lack of cost planning/monitoring during pre- and post-contract stages, improvements to standard drawings during the construction stage, design changes, and inaccurate quantity take-off, (Aftab Hameed M. and Ismail Abdul R., 2014)

Cost escalations in contracts can have different causes. They can be a result of wrong assumptions in the description of the works, which in turn may result in changes and additions to what was originally agreed. Cost escalations may also be a result of unforeseen external circumstances that need to be considered and budgeted for, or when the client requires changes to the agreed scope to achieve an intended function. Cost estimation is not an exact science. Therefore, contingency is needed so that, for example, changes to the scope do not automatically result in cost overruns. By adding contingency, cost overruns in contracts may be absorbed so that project overruns are avoided, (Morten Welde and Roy Endre Dahl, 2021)

A major factor in project success is completion on budget. Furthermore, cost performance is the key measurement of an organization's productivity and profitability. Project cost overrun is measured as the difference between the planned cost (estimate) and actual construction cost on completion. The construction industry in Afghanistan is generally unable to complete projects within the original estimated cost]. A number studies have been conducted to address the issue and factors that cause project cost overruns. Research by Flyvbjerg et al. revealed that 9 out of 10 construction projects experienced cost overrun with an average budget overrun of 28%. 258 construction projects in 20 countries were studied where the cost performance was very poor, (Ghulam A. Niazia and Neol P., 2017).

Similarly, the studies on cost overrun also look for reasons behind the cost overrun (and corresponding benefit underperformance). Flyvbjerg et al. (2002, 2003) argues that a main problem is that planners and promoters often deliberately underestimate costs and risks and overestimate the benefits in order to increase the likelihood that their project gets approval and funding. This view is supported by other studies as well – there are political or strategic reasons for cost overrun. Similar reasons are identified by Merrow (2011) in business projects, and in addition he points to inadequate cost estimation and risk assessments. We know that there are strategic and tactical reasons for projects to experience cost overrun and benefits underperformance. These reasons need to be understood and handled well to improve PM performance, (Ole J. Klakegga, Steen L. et al., 2016).

Poor cost performance in construction projects is a well-known element in resulting huge amount of cost overrun as faced by construction industry globally. The cost overrun is very dominant in both developed and developing countries. It affects both physical and economic development for the country and thus, it is important to ensure construction projects are completed within the estimated cost (Aftab Hameed M. and Ismail Abdul R., 2014).

2.7.1.2. Causing Factors to Road Construction Projects Based on Time Performance

The factors influencing construction schedule vary to a greater extent from people/staff attitude and behavior, the current timeline status, financing mode, completion pressure and requirement urgency, which all make the spread of factors very wide. Each factor contributes some influence on scheduling to the maximum extent. Hence, the scheduler and schedule making should have a full pledged wider perspective of all aspects which contribute to the project. Practically, a person

cannot have specialties on too many things, rarely on experts' opinion and consultations, which is properly integrated for formulation of the schedule (R. Vidhyasri and R. Sivagamasundari, 2017).

Delay in road construction project completion time can be caused by several problems. Poor specialized management, rising cost of materials, fluctuation of prices and poor site management have also been recognized as factors triggering a delay in road construction project completion time. In order to anticipate the encounter of timely road construction project delivery, Samuel (2008) endorses that project time management be an important or rather key priority for the contractors and that the nomination of a registered project manager for each contract should be a compulsory condition of qualification, track record, past assignments, endorsement and capacity in the tendering process. Delays in road construction projects can be avoided by use of effective contract management. The major challenges impeding completion of road construction projects can be resolved through the use of effective contract management because they are basically human, materials and logistics trinity, (Gloria Syombua Mulinge, , 2017).

Mansfield identified 16 major factors that caused delays and cost overruns in Nigeria. A questionnaire survey was carried out with contractors, consultants and client organizations in Nigeria. They presented that the causes of delay and cost overruns in Nigerian construction projects were attributed to finance and payment arrangements, poor contract management, shortages in materials, inaccurate estimation, and overall price fluctuations (Murali S. and Yau W. Soon,, 2007).

Ousseni Bayaandjinbo (2016) identified the most frequent, severe and important cause of schedule delay affecting public construction projects in Burkina faso, basically to enhance the managerial capability of project managers. After analyzing the results of the questionnaire sent out to 140 experts, using the quantitative statistical method, the top five most important delays were ranked: Financial capability of contractor, financial difficulties of owner, equipment availability of the contractor, slow payment for completed work and poor subcontractor performances by the contractor. To validate the result of this study they compared it with the scheduled delays found in 11 other countries. The financial capability of the contractor was found be the most encountered factor for delay, (R. Vidhyasri and R. Sivagamasundari, 2017).

Sambasivan and Soon (2007) identify and evaluate the most significant causes of project delay in Malaysian construction industry, which are improper planning, poor site management, inadequate

experience of the contractor, inadequate finance of the client and payments for completed work, problems related to subcontractors, material shortage, labour supply, availability and failure of equipment, lack of communication between parties and mistakes during the construction stage, (Shumank Deep, Mohd Bilal Khan, et al., 2017).

2.7.1.3. Causing Factors to Road Construction Projects Based on Quality performance

There are many factors affecting construction quality, such as design, time, cost, teamwork, communication, safety, monitoring, and documents availability and administrative. Because of the fixed project location, large volume and different projects environments, poor control of these factors will produce quality problems. During controlling the whole process of construction, only accord with the required quality standards and user promising requirements, fulfilling quality, time, cost, etc., construction process could get the best economic effects, (Faidhi A. et al., 2018)

Quality of construction is a key component of perceived value to both clients and contractors. The International Federation of Consulting Engineers (FIDIC) noted that “lack of quality in construction is manifested in poor or non-sustainable workmanship, and unsafe structures; and in delays, cost overruns and disputes in construction contracts”. Value and quality of construction are of concern to both public and private sector clients (Ngosong, 2015) (Mayie Banyenzaki, 2016).

Quality and construction control Quality control is the responsibility of the contractor. However, it could be categorized into two parts i.e.

- The quality of workmanship
- The construction materials.

Concerning the workmanship, it is usual to have experienced Foreman to be on the Construction Site continuously until the project is completed. Apart from this, the building materials are tested to ensure the quality i.e., since the Ethiopian standard code of practice sets minimum quality requirements, the materials should fulfil the standards specified by the code before using them in the construction project. These qualitative tests are mostly done according to the Ethiopian standards institution, by building design enterprise, as well as by the university and other firms.

2.7.1.4 Summary of Reasons of Delay and Cost Overruns in Road Construction Projects

Given the fact that; delay and cost overruns are a global problem in all building construction industry, as per its causes whether due to cost estimation errors or any other reasons, still differs

from one country to another depending on the political, economic and cultural reasons. Besides, delay and cost overruns may lead to an abandonment or termination of a building construction project, if the causes are not well mitigated. Voluminous studies have been conducted to identify the causes of delay and cost overrun in building construction projects, as summarized in Table 2.1, (Jaffari S. Jongo¹ , Dennis N. G. A. K. Tesha, et al.,, 2019).

Table 2. 1 Summary of Causes of delays and cost overrun as retrieved from different literature review

S. No	Causes of Delay and Cost Overrun	Source
01	Absence of consultants site staff, and the relationship between management and labor,	Aziz, R. (2013); Factors Causing Cost Variation for Constructing Wastewater Projects in Egypt, In The Alexandria Engineering Journal, Vol. (52) (01), 51 - 66.
02	Poor material handling on site,	Cunningham, T., (2017); “What Causes Cost Overruns on Building Projects? - An Overview”, School of Surveying and Construction Management, Dublin Institute of Technology, 28 Pages, (https://arrow.dit.ie/cgi/viewcontent.cgi?article=1070&context=beschreoth).
03	Dispute on site,	Dolage, D.A.R., & Pathmarajah, T (2015); “Mitigation of Delays Attributable to the Contractors in the Construction Industry of Sri Lanka - Consultants’ Perspective”, in the Journal of Engineer, Vol.(08)(01), 21 - 30, Published by the Institution of Engineers.
04	Unrealistic contract duration imposed by the owner,	Aziz, R. (2013); Factors Causing Cost Variation for Constructing Wastewater Projects in Egypt, In The Alexandria Engineering Journal, Vol.(52)(01), 51 - 66.
05	Act of God (weather),	Cunningham, T., (2017); “What Causes Cost Overruns on Building Projects? - An Overview”, School of Surveying and Construction Management, Dublin Institute of Technology, 28 Pages, (https://arrow.dit.ie/cgi/viewcontent.cgi?article=1070&context=beschreoth).

06	Delay of material and equipment delivery,	Alzara, M., Kashiwagi, J., Kashiwagi, D., Al-Tassan, A., (2016); “Using PIPS to Minimize Causes of Delay in Saudi Arabian Construction Projects: University Case Study”, in the Procedia Engineering, the International Conference on Sustainable Design, Engineering and Construction, Published by ELSEVIER, Science Direct, Peer-review under responsibility of the organizing committee of ICSDEC 2016, Page 932-939, (doi:10.1016/j.proeng.2016.04.121).
07	Strikes by site personnel,	Iyer, K, Chaphalkar, N. & Joshi, G.A. (2007); Understanding Time Delay Disputes in Construction Contracts, In the International Journal of Project Management, Vol.(26)(02), 174 - 184.
08	Low productivity of labor, and equipment	Kesavan, M., Gobidan, N.N., & Dissanayake, P.B.G., (2015); “Planning & Mitigation Methods to Reduce the Project Delays in Sri Lankan Civil Engineering Construction Industries”, A Paper Presented During the 6 th International Conference on Structural Engineering and Construction Management, (ICSECM), Kandy, Sri Lanka, 11 th – 13 th December, 2015, Page 102 to 107.
09	Poor contract management; and poor project management	Azhar, N, Rizwan, U, Farouqui, F. & Ahmed, S. (2008); Cost Overrun Factors in Construction Industry of Pakistan; Advancing and Integrating Construction Education Research & Practice, 499 - 508.
10	Omission and errors in the Bill of Quantity,	Kyando, R. (2013); “Magnitude of Time and Cost Overruns in Building Projects”, Unpublished Undergraduate Dissertation, Department of Building Economics, Ardhi University(ARU), Dar-Es-Salaam, Tanzania.
11	Government interference,	Mtallib, M.O.A. (2007); Evaluation of the Relationship Between Delayed Payments and Cost and Time Overruns,

		Unpublished Masters Dissertation, Department of Building Faculty of Environmental Design, Nigeria, Ahmadu Bello University.
12	Slowness or delay in giving instruction,	Kyando, R. (2013); “Magnitude of Time and Cost Overruns in Building Projects”, Unpublished Undergraduate Dissertation, Department of Building Economics, Ardhi University(ARU), Dar-Es-Salaam, Tanzania.
13	Political instability,	Ramabhadran, M., (2018); “An Investigation into Cost Overrun in Construction Projects in United Arab Emirates”, in the International Journal of Construction Engineering and Management, Vol.(07)(01), 01 - 21, Published by Scientific & Academic Pulishing, (DOI: 10.5923/j.ijcem.20180701.01).
14	Price fluctuation,	Azhar, N, Rizwan, U, Farouqui, F. & Ahmed, S. (2008); Cost Overrun Factors in Construction Industry of Pakistan; Advancing and Integrating Construction Education Research & Practice, 499 - 508.
15	Lack of cost and monitoring planning; poor cost control,	Azhar, N, Rizwan, U, Farouqui, F. & Ahmed, S. (2008); Cost Overrun Factors in Construction Industry of Pakistan; Advancing and Integrating Construction Education Research & Practice, 499 - 508.
16	Poor economic condition,	Naveenkumar, G.V. & Prabhu, V. (2016); Factors Influencing Time and Cost Overruns in Construction Projects, In the International Journal of Innovative Research in Science, Engineering and Technology.
17	Shortage of material in the market,	Doran, T, Mansfield, N.R & Ugwu, O.O, (1994); Causes of Delays and Cost Overrun 4in Nigerian Construction Projects, In the International Journal of Project Management, Vol.(12)(04), 254 - 260.

18	Delay of material approval by consultant	Naveenkumar, G.V. & Prabhu, V. (2016); Factors Influencing Time and Cost Overruns in Construction Projects, In the International Journal of Innovative Research in Science, Engineering and Technology.
19	Variation at the design stage,	Jeykanthan J, & Jayawardena A.K.W, (2012); Mitigating Delays in Donor Funded Projects in Sri Lanka, In the KSCE Journal of Civil Engineering, Vol.(22)(16), 221 - 234.
20	Problems with neighbors,	Naveenkumar, G.V. & Prabhu, V. (2016); Factors Influencing Time and Cost Overruns in Construction Projects, In the International Journal of Innovative Research in Science, Engineering and Technology.
21	Large and complex projects,	Naveenkumar, G.V. & Prabhu, V. (2016); Factors Influencing Time and Cost Overruns in Construction Projects, In the International Journal of Innovative Research in Science, Engineering and Technology.
22	Equipment and tool shortage on site,	Kesavan, M., Gobidan, N.N., & Dissanayake, P.B.G., (2015); “Planning & Mitigation Methods to Reduce the Project Delays in Sri Lankan Civil Engineering Construction Industries”, A Paper Presented During the 6 th International Conference on Structural Engineering and Construction Management, (ICSECM), Kandy, Sri Lanka, 11 th – 13 th December, 2015, Page 102 to 107.
23	Unskilled operators or workforce, and lack of experience for the work force and contactors,	Alzara, M., Kashiwagi, J., Kashiwagi, D., Al-Tassan, A., (2016); “Using PIPS to Minimize Causes of Delay in Saudi Arabian Construction Projects: University Case Study”, in the Procedia Engineering, the International Conference on Sustainable Design, Engineering and Construction, Published by ELSEVIER, Science Direct, Peer-review under responsibility of the organizing committee of ICSDEC 2016, Page 932-939, (doi:10.1016/j.proeng.2016.04.121).

24	Incomplete design and estimate at the time of tender, as well as lack of design details and specifications,	Aziz, R. (2013); Factors Causing Cost Variation for Constructing Wastewater Projects in Egypt, In The Alexandria Engineering Journal, Vol.(52)(01), 51 - 66.
25	Owner or user interference,	Assaf, S.A. & Al- Hejji, S. (2006); Causes of Delays in Large Construction Projects, In the International Journal of Project Management, Vol.(24)(04), 349 - 357.
26	Poor or lack of communication and coordination between parties,	Al-Keim, A., (2017); “Strategies to Reduce Cost Overruns and Schedule Delays in Construction Projects”, Published Ph.D Dissertation, Doctor of Business Administration, College of Management and Technology, Walden University, Walden Dissertations and Doctoral Studies Collection, 145 Pages.
27	Improvement of standard drawing during, construction stage,	Jeykanthan J, & Jayawardena A.K.W, (2012); Mitigating Delays in Donor Funded Projects in Sri Lanka, In the KSCE Journal of Civil Engineering, Vol. (22) (16), 221 - 234.
28	Poor site condition,	Jeykanthan J, & Jayawardena A.K.W, (2012); Mitigating Delays in Donor Funded Projects in Sri Lanka, In the KSCE Journal of Civil Engineering, Vol.(22)(16), 221 - 234.
29	Delay or slowness in decision making,	Alzara, M., Kashiwagi, J., Kashiwagi, D., Al-Tassan, A., (2016); “Using PIPS to Minimize Causes of Delay in Saudi Arabian Construction Projects: University Case Study”, in the Procedia Engineering, the International Conference on Sustainable Design, Engineering and Construction, Published by ELSEVIER, Science Direct, Peer-review under responsibility of the organizing committee of ICSDEC 2016, Page 932-939, (doi:10.1016/j.proeng.2016.04.121).
30	Poor site management and supervision,	Al-Keim, A., (2017); “Strategies to Reduce Cost Overruns and Schedule Delays in Construction Projects”, Published Ph.D Dissertation, Doctor of Business Administration,

		College of Management and Technology, Walden University, Walden Dissertations and Doctoral Studies Collection, 145 Pages.
31	Deficient estimation of cost,	Ramabhadran, M., (2018); “An Investigation into Cost Overrun in Construction Projects in United Arab Emirates”, in the International Journal of Construction Engineering and Management, Vol.(07)(01), 01 - 21, Published by Scientific & Academic Publishing, (DOI: 10.5923/j.ijcem.20180701.01).
32	Shortage of manpower, and insufficient number of staff,	Alzara, M., Kashiwagi, J., Kashiwagi, D., Al-Tassan, A., (2016); “Using PIPS to Minimize Causes of Delay in Saudi Arabian Construction Projects: University Case Study”, in the Procedia Engineering, the International Conference on Sustainable Design, Engineering and Construction, Published by ELSEVIER, Science Direct, Peer-review under responsibility of the organizing committee of ICSDEC 2016, Page 932-939, (doi:10.1016/j.proeng.2016.04.121).
33	Corruption and bureaucracy in government,	Ramabhadran, M., (2018); “An Investigation into Cost Overrun in Construction Projects in United Arab Emirates”, in the International Journal of Construction Engineering and Management, Vol.(07)(01), 01 - 21, Published by Scientific & Academic Publishing, (DOI: 10.5923/j.ijcem.20180701.01).
34	Financial difficulties of the owner and the contractor,	Al-Keim, A., (2017); “Strategies to Reduce Cost Overruns and Schedule Delays in Construction Projects”, Published Ph.D Dissertation, Doctor of Business Administration, College of Management and Technology, Walden University, Walden Dissertations and Doctoral Studies Collection, 145 Pages.
35	Inadequate project formulation; and midstream changes in scope and volume of work,	Ramabhadran, M., (2018); “An Investigation into Cost Overrun in Construction Projects in United Arab Emirates”, in the International Journal of Construction Engineering and

		Management, Vol.(07)(01), 01 - 21, Published by Scientific & Academic Publishing, (DOI: 10.5923/j.ijcem.20180701.01).
36	Design changes, and delay in approving the changes,	Cunningham, T., (2017); “What Causes Cost Overruns on Building Projects? - An Overview”, School of Surveying and Construction Management, Dublin Institute of Technology, 28 Pages, (https://arrow.dit.ie/cgi/viewcontent.cgi?article=1070&context=beschreoth).
37	Risks and uncertainties associated with projects, as well as lack of project risk analysis,	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
38	Inaccurate evaluation of projects time/ duration against the project complexity,	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
39	Non-performance of main contractors, subcontractors and nominated suppliers,	Al-Keim, A., (2017); “Strategies to Reduce Cost Overruns and Schedule Delays in Construction Projects”, Published Ph.D Dissertation, Doctor of Business Administration, College of Management and Technology, Walden University, Walden Dissertations and Doctoral Studies Collection, 145 Pages.
40	Design documentation error and discrepancy,	Srdic, A., & Selih, J., (2015); “Delays in Construction Projects: Causes and Mitigation,” In an International Journal of Organization, Technology and Management in Construction, Vol. (07)(03), 1383 - 1389.
41	Design error and inappropriate design solution,	Al-Keim, A., (2017); “Strategies to Reduce Cost Overruns and Schedule Delays in Construction Projects”, Published Ph.D Dissertation, Doctor of Business Administration, College of Management and Technology, Walden University,

		Walden Dissertations and Doctoral Studies Collection, 145 Pages.
42	Delay in progress payment; site mobilization; and, in obtaining permits from municipality,	Heravi, G., & Mohammadian, M., (2017); “Cost Overruns and Delay in Municipal Construction Project in Developing Countries”, In the AUT Journal of Civil Engineering, Vol.(01)(01), 31 - 38 (DOI: 10.22060/ceej.2017.12189.5163)
43	Change in orders by the owner during construction,	Cunningham, T., (2017); “What Causes Cost Overruns on Building Projects? - An Overview”, School of Surveying and Construction Management, Dublin Institute of Technology, 28 Pages, (https://arrow.dit.ie/cgi/viewcontent.cgi?article=1070&context=beschreoth).
44	Re-work due to errors during construction,	Cunningham, T., (2017); “What Causes Cost Overruns on Building Projects? - An Overview”, School of Surveying and Construction Management, Dublin Institute of Technology, 28 Pages, (https://arrow.dit.ie/cgi/viewcontent.cgi?article=1070&context=beschreoth).
45	Ineffective planning and scheduling of project	McCord, J., McCord, M., Davis, P.T., Haran, M., & Rodgers, W.J., (2015); “Understanding Delays in Housing Construction: Evidence from Northern Ireland”, In the Journal of Financial Management of Property and Construction, Vol. (20) (03), 286 - 319 Published by Emerald Group Publishing Limited, (DOI: 10.1108/JFMPC-07-2015 -0028).

Source: Adapted from (Luvara G.M.V., Phoya, et al (2018)); modified by Authors, (2019), (Jaffari S. Jongo1 , Dennis N. G. A. K. Tesha, et al.,, 2019), and reviewed by the researcher, 2022.

2.7.2. Assessing the Impact of Poor Contract Administration in Road Construction Projects

The most important impacts of project failure are poor quality, cost overrun, and time overrun. Findings showed that contracts should only be awarded if funds are available at the procurement stage. The mission of construction is constrained in terms of the available time and amount of available funds. For any agreed and signed project contracts to be executed, funds have to be released to initiate the project. The funds released may be installment payments, part payments, or

full payments. If it is a part payment, then it has an expiring date to avoid the ongoing construction project being ceased along the way, (Stephen B. Obebe, et al, 2020).

The construction industry faces many problems, such as project overruns, time extensions, conflict among the parties, and the lack of a quality assessment system. The three main reasons that these problems are so widespread can generally be said to be the unique nature of projects, the fragmented and highly competitive nature of the construction industry, and the increasing challenges facing the industry (B.F. Bitamba & S.H. An, 2020).

There are many abandoned projects, failed projects, and ongoing projects in Nigeria today. Some of the continuing projects have failed and been abandoned for lots years, however because of the intervention of the clients (i.e., Federal/State Government, individuals), the development is ongoing. Some production projects nonetheless continue to be failed and abandoned, while, a few were revoked and rewarded to every other contractor. Some of the presented contracts, failed production projects and on-going projects in Nigeria are: Lagos-Calabar Railway Project linking Lagos withinside the West to Calabar withinside the East on the fee of \$11billion USD; Mambilla hydroelectric energy plant undertaking connecting 3 dams throughout the Donga River in Taraba State on the fee of \$5.eight billion; the Ibeju Lekki Deep Seaports withinside the axis of Lagos on the fee of \$1.2 billon to be due for final touch withinside the yr 2021; the Eko Atlantic City that`s a mega undertaking constructed on Victoria Island and adjoining to Lagos, Nigeria; the Lagos–Ibadan popular gauge rail line on the fee of \$2.1billion USD; the Baro Inland Port Project in Agaie neighborhood authorities location of Niger nation on the fee of N5.eight billon has remained dormant 8 months after commissioning via way of means of President Muhammadu Buhari because of non-launch of fund which had stalled its final touch; the current approval via way of means of Federal Government of Nigeria of the Ibadan to Kano popular rail undertaking on the fee of \$5.3billion; the instances of many failed and abandoned projects withinside the Niger Delta vicinity of Nigeria wherein research is on-going via way of means of the Chairman, House of Representatives at the Niger Delta Affairs, Mr. Nicholas Ossai; the Bacita-Kpandaragi –Patidzhuru Tsaragi junction roads in Edu L.G.A. of Kwara State which has failed and abandoned for extra than thirty (30) years now without Government intervention if now no longer with inside the years 2018 while it had failed culvert alongside the roads that the Kwara State Government intrude withinside the rehabilitation; Jebba/Bacita Junction - Bacita township 18km had failed and

abandoned for extra than thirty (30) years without Government intervention, because the inception of the primary civilian governor of the nation Late Alhaji Adamu Attah in 1979, who built the roads half-way, given that then it's far the non-public individuals, and industrial drivers that usually cross on skeletal rehabilitations, and but to be presented, (Stephen B. Obebe, et al, 2020).

2.7.2.1 Time Delay of Road Construction Projects Contracts

Delays in construction projects may lead to disputes between stakeholders to the project. Irrespective of which party's negligence that results in the dispute, if not handled tactfully, it can lead to arbitration or litigation. A dispute can be a very expensive situation to deal with. The direct impacts may include hiring of attorneys, expert witnesses and damage settlements whereas the indirect impacts may include opportunity costs of dispute resolution, assigning company resources to the dispute and lost business relationships. Experts have estimated the expenditures in construction disputes and litigations in the United States to have increased by an average of 10% over the last decade with a total annual value of \$5 billion (Michel 1998, Pena-Mora, Sosa and McCone 2003), (John Kwabla Gomelesio, 2013).

Another effect of construction delays is the total abandonment of projects. Delays in construction projects can lead to the parties abandoning the project entirely. If a construction project gets abandoned, it reduces employment opportunities, slows down economic activities, government loses revenue and foreign investors get deterred from funding construction projects in the economy. Aside these, there is a serious damage to the reputation of the parties to the construction contract, (John Kwabla Gomelesio, 2013).

The consequences of general contractors' poor contract administration performance are waste of resources, and time, on non-productive, and non-value-added activities, and in effect work against sustaining the construction industry (George Okechukwu Okere, 2012).

In relation to false claims, a company suffers serious consequence if it fails to conduct its business ethically. Unethical companies may face loss of customers, high employee turnover, low productivity, poor image, and may also face civil and criminal penalties, (George Okechukwu Okere, 2012).

2.7.2.2. Cost Overrun of Road Construction Projects Contracts

Sometimes, it is necessary or desirable to change the terms of a contract mid-way through its completion. These could be changes to timeframes, description of deliverables, or even substantive clauses. Almost all contracts will contain a provision that requires variations to the contract to be made in writing. Some contracts include a specific process by which variations can be proposed and accepted. Minor variations (e.g. changes to dates and prices) may be formalized simply by exchange of letters or emails – and making it very clear in that document that this is intended to vary the terms of the contract. If the proposed variations are more significant, and have the potential to affect the scope and effect of the contract, then you may have to undertake similar steps in regard to planning, consultation, drafting and approvals, as you would if developing a new contract. These more major variations should be enacted in a formal amendment to the contract – which your legal advisor can help draft, (Management Legal and Risk Handbook, 2007).

2.7.2.3. Change Orders in Road Construction Project Contracts

A change order is a written order to a contractor, entrusted by the employer's representative with the conception/approval of the employer, and to be delivered after the execution of contract allowing, to a change in the work or adjustment in the contract amount or contract period. The issue of change order management in the construction industry has received a lot of attention from researchers. Numerous definitions given in order of modification by numerous researchers. Change orders include additions, omissions, and substitutions, changes in quality, quantity, shape, character, species, position, dimensions, levels or lines, and changes in the specified order, manner, or timing of performance of work. (PPA 2011). A change to an order means any change including increasing or decreasing the amount of work included in the contract, omission of such work, changing the nature, quality or nature of such work, changing the plane, line, position and dimensions of any part of the works and performing any kind of additional work necessary to complete the work. Further, such changes shall not in any way affect or void the contract (MoWUD 1994), (Lelise G., 2019).

2.7.2.4. Fraud and Corruption

It is the Government of the Federal Democratic Republic of Ethiopia's policy to require that Public Body, as well as bidders/suppliers, to observe the highest standards of ethics during the procurement and the execution of contracts. In pursuance of this policy, the Government of the

Federal Democratic Republic of Ethiopia represented by the Public Procurement and Property Administration Agency (herein referred to as the Agency) requires that Public Bodies shall include in bidding documents, provisions against corrupt practices, (GCC. Sub-clause 5.1). If the Public Body determines that the Contractor and/or its Personnel, sub-contractors, services providers and suppliers has engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices, in competing for or in executing the Contract, then the Public Body may, after giving 14 days' notice to the Contractor, terminate the Contractor's employment under the Contract, and the provisions of GCC Clause 21 shall apply as if such expulsion had been made under GCC Sub-Clause 21.2(i); (GCC. Sub-clause 5.2). The Agency defines, for the purposes of these provisions, the terms set forth below as follows, (GCC. Sub-clause 5.3):

- **“Corrupt practice”** is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the procurement process or in contract execution, and
- **“Fraudulent practice”** is any act or omission, including misrepresentation that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation.
- **“Collusive practices”** is a scheme or arrangement between two or more Contractors, with or without the knowledge of the Public Body, designed to establish prices at artificial, noncompetitive levels, and
- **“Coercive practices”** is harming or risking to harm, directly or indirectly, persons or their property to influence their participation in a procurement process, or affect the execution of a contract.
- **“Obstructive practice”** is
 - (i) Deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede the Federal Ethics and Anticorruption Commission, the Federal Auditor General and the Public Procurement and Property Administration Agency or their auditors' investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or risking, harassing or intimidating any party to prevent their from

disclosing their knowledge of matters relevant to the investigation or from pursuing the investigation, or

- (ii) Acts intended to materially impede the exercise of inspection and audit rights provided for under, (GCC Sub-clause 56.2).

The Agency will debar a Contractor from participation in public procurement for a specified period of time if it at any time determines that the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a contract, (GCC. Sub-clause 5.4). The Agency reserves the right, where a Contractor has been found by a national or international entity to have engaged in corrupt or fraudulent practice, to declare that such a Contractor is ineligible, for a stated period of time, to be awarded a Government funded contract, (GCC. Sub-clause 5.5). The Agency will have the right to require that, in contracts funded by the Government of Ethiopia, a provision be included requiring Contractors to permit the Agency to inspect their accounts and records relating to the performance of the contract and to have them audited by auditors appointed by the Agency, if the Contractor engages in any corrupt practice, (GCC. Sub-clause 5.6). Any communications between the Contractor and the Public Body or the Agency related to matters of alleged fraud or corruption must be made in writing, (GCC. Sub-clause 5.7), (FDRE, FPPA, 2011).

2.7.2.5. Termination of Road Construction Projects Contracts

Termination is the last resort that rarely needs to be done. Contract termination reflects a failure by all parties to the contract. When the contract terms permit termination, the parties are no longer obligated to continue performance of their duties and obligations under the contract. Depending on the specific contract terms, parties may terminate without cause (Termination for Convenience), with cause (Termination for Default) or for force majeure, (the University of Texas at San Antonio, CMH (02.26.16) (Rev. 02.27.2020).).

Table 2.2 Change Order Definition by Different Authors

Authors	Change Order Definition
(PPA 2011)	Change order include additions, omissions, substitutions, changes in quality, quantity, form, character, kind, position, dimension, level or line and changes in the specified sequence, method or timing of execution of the works
(MoWUD 1994)	Change order is variations that includes, increasing or decreasing the quantity of any work included in the Contract, omitting any such work, Changing the character, quality, or kind of any such work, Changing the levels, lines, position and dimensions of any part of the Works, and executing additional work of any kind necessary for completion of the Works. Moreover, no such variation shall in any way vitiate or invalidate the Contract
(FIDIC 1987)	Change order is variations that includes, increasing or decreasing the quantity of any work included in the Contract, omitting any such work (but not if the omitted work is to be carried out by the Employer or by another contractor),changing the character or quality or kind of any such work, changing the levels, lines, position and dimensions of any part of the Works, executing additional work of any kind necessary for the completion of the Works, or changing any specified sequence or timing of construction of any part of the Works
(A. S. Hanna 2002)	Change is any event that results in a modification of the original scope, execution time, or cost of work, happens on most projects due to the uniqueness of each project and the limited resources of time and money available for planning”
(Zawawi 2010)	Change order is the work that omitted or added from the original scope of work of a contract, which alters the original amount or completion date.

(CII. 2000)	A change is any modification to the contractual guidance provided to the contractor by the owner, owner's agent, or design engineer.
(Galloway 2007)	Change in the construction industry is defined as Transformation or modification, a variation or deviation, the substitution of one thing For another, and a replacement or substitution.
(Mokbel 2003)	In construction, change order is defined as "an action that specifies and Justifies a change to the scope of a construction contract that alters the original time of Completion or the project total cost, or both".
(Libor, Lewis and Lpp 2003)	Change order is a written instrument prepared by the architect and signed by the owner, contractor and architect.
(Bolin 2013)	Change order is a document that contractually alters an original agreement between the signed parties.

Source: Lelise Gobena thesis (pg. 6-7) and reviewed by the researcher, 2022

2.8. Determining Appropriate Mitigation Measures of Poor Contract Administration in Road Construction Projects

According to the U.S. Government Accountability Office-GAO (2006), from 2001 to 2005, the U. S. Department of Defense (DOD) indicted 718 companies on contracting fraud. Some of the measures noted by the DOD for reducing contracting fraud, waste, and abuse included senior leadership, competent workforce, and surveillance of contracts from award to closeout, (George Okechukwu Okere, 2012).

According to various studies, a construction project is commonly acknowledged as successful when it is completed on time, within budget, and in accordance with its quality as per design and specifications (B.F. Bitamba & S.H. An, 2020)

Monitoring the performance of the contractor regularly is a very important part of road construction. The monitoring system differs among the road authorities. However, a monitoring system is necessary to maintain the quality of work and also to record the data for future Research and Development in the road authorities, (Mayie Banyenzaki, 2016).

Performance is what results from a team reaching the objectives of the outsourced project. In outsourcing as with any other project context, project performance can be measured as the extent to which a project is completed in time, within budget, and demonstrates a quality that satisfies customer requirements (Kerzner, 2009). The subject of project success is at the heart of project management. Project Management Institute (2013) has stated that the project manager is responsible and accountable for setting realistic and achievable boundaries for the project and to accomplish the project within the approved baselines. Many factors impact the degree of success in outsourced projects. In this study, performance of outsourced projects was deemed to be influenced by contract management. A wide range of performance indicators such as operational, financial, behavioral, and attitudinal outcomes have been applied to investigate the added value of teams in organizations (Delarue et al., 2004). However, since outsourced projects always have a specific performance outcome, this study adhered to Hackman's (1987) concept of performance being the degree to which a team meets its goals, and how well its output fulfils project objectives, (Joshua M. Mutua, Esther Waiganjo, et al., 2014).

Mutua, Waiganjo and Otayo (2015) study assessed the effect of contract management on performance of outsourced projects in Nairobi. They found out that essentially contract management had a positive relationship with project performance. Contract management and other factors led to 66 percent difference in project performance and dispute resolution mechanism were rated as important contractual devices. The study recommends the introduction of contract management training and certification for project managers and project team members to enhance project performance. Camen, Gottfridsson and Rundh (2012) also studied operational factors influencing strategic partnerships social housing in the UK. They conclude that poor management of expectations between partners undermines trust and confidence in the process. As the authors suggest, contracts function as a basis in building relationships, (Ochola Loy Salome, 2018).

2.8.1. Proper Planning

With proper planning, Midwestern State University (MSU) is more likely to successfully achieve its contracting objectives. During the planning phase each of the following elements of contract management must be considered: Plan; identify contracting objectives and contracting strategy; Procurement: fairly and objectively select the most qualified contractors; Contract Formation/Rate/Price Establishment: ensure the contract contains provisions that hold the

contractor accountable for producing desired results, including all relevant terms and conditions as well as establish processes that are cost-effective and aligned with the cost of providing the goods and services; and Contract Oversight: monitor and enforce the terms of the contract, (Barry L. Macha, General Counsel, et al., 2016.)

2.8.2. Risk and risk management

Risk has been expressed in different forms. Yet some crucial attributes, similar as query, probability, effect/ impact, and so on, constantly appear in numerous of these delineations. The ISO description is one of the constantly appertained delineations and stated as ‘risk is the effect of query on objects’ (ISO 2018). The other common description is that offered by PMI stated it in association with a design as ‘risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or further design objects’ (PMI 2013). numerous pitfalls faced by businesses cannot be excluded (Enshassi et al. 2006; Smith et al. 2006), hence, success is measured in terms of the effectiveness of the risk operation (RM) approach espoused (Hillson 2012). RM, according to IRM (2002), is the process in which organisations methodically address the pitfalls attaching to their conditioning to achieve sustained benefit within each exertion and across the portfolio of all conditioning. Although different approaches are used to describe RM way, several of the RM fabrics involve some common introductory stages. Upon reviewing the risk operation processes handed in different literature, Goh and Abdul- Rahman (2013) declared that risk planning, risk identification, risk analysis, risk response and risk monitoring and control are the well- accepted way in the RM process. According to Zhao et al. (2015) and Low et al. (2009), the abecedarian stages are risk identification, risk analysis, and risk response. Hence, this paper focuses on the three (3) risk operation way, videlicet, the identification, analysis, and evaluation of risk events that may affect the performance of the EDCs, (Wubet, Worku; et al., 2021).

2.8.2.1 Identify and Manage Risk

Risks and risk treatments established earlier in the contract management cycle need to be reviewed once the contract is signed, and new risks and mitigation strategies need to be considered. New risks may include; Contract Manager who does not have the time, or experience to capably manage the contract, Contractor failing to meet contract deliverables on time, to agreed standards, or to agreed contract pricing schedule, Contract Manager fails to act on contractor underperformance,

Contract changes not dealt with as a contract variation and Stakeholders not being consulted or kept informed, (Australian National University, 2012.)

2.8.3.2 Risk analysis

Once the potential risk events are produced, the risk analysis follows, which examines each identified risk and determines risk scores. A probability – impact matrix is the most common and familiar risk analysis techniques (APM 2008) used to determine the relative risk scores (values) by multiplying the measures of probability and impact of the event (BSI 2010; Elmontsri 2013). It is also commonly suggested to avoid wasting time and resources on analysis of uncertainties that are of relatively less importance in terms of their impact on the set objectives. The ultimate goal of risk analysis is, therefore, to prioritize risks (APM 2008; Ehsanifar and Hemesy 2019) that helps to extricate risks that matter most. Besides the APM (2008) guideline has outlined two essential reasons for prioritizing risk: (1) to inform stakeholders of the range of outcomes arising from uncertainty, and (2) to prioritize risk responses for the effective management of risks, (Wubet, Worku; et al., 2021).

2.8.3. Monitoring Performance

Monitoring the performance of the contractor is a key function of proper contract administration. The purpose is to ensure that the contractor is performing all duties in accordance with the contract and for the University to be aware of, and address any developing problems or issues.

Small dollar or less complex contracts normally require little, if any, monitoring. However, that does not preclude the possibility of more detailed monitoring if deemed necessary by the University. Conversely, large dollar contracts may need little monitoring if the goods and/or services are not complex, and the University is comfortable with the contractor's performance, and the level of risk associated with the contract.

Table 2. 3 Monitoring Performance

Activity	Responsibility	Approval
Monitoring Performance	The Contract Manager/Administrator is responsible for monitoring and managing risks, and reporting on contractual outcomes in accordance with progress and review schedules.	The Contract Manager/Administrator should regularly report to end-users. The Authorized Delegate should approve reports of any major reviews

(Australian National University, 2012.)

2.8.4. Contract Remedies

The purpose of remedies is to protect an organization when the contract is not performed in accordance with its terms and conditions or when the contract is breached. Examples of remedies are: invoking liquidated damages, payment withholding, claiming performance bonds, and acting on warranties/guarantees. Liquidated damages refer to a sum explicitly agreed in advance between the organization and the contractor that will be payable as damages for any breach of contract. In the majority of cases, this applies to delay in performance. Provisions for liquidated damages are usually included in the general conditions of the contracts. When delays caused by the contractor result in extra costs, or loss of revenue and other benefits, they are covered by liquidated damages paid by the contractor. Liquidated damages are calculated as a percentage of the contract value up to a certain amount. Performance securities such as performance bonds or other forms of contract remedies are usually required to be submitted by the contractor at the time of award, (FAO, 2016.).

Remedies protect an organization when the contract is not carried out in accordance with its terms and conditions or when the contract is breached. Although they are part of standard contract clauses, the review found that remedies are often not enforced in practice, especially in cases involving liquidated damages and/or performance bonds, (George A. Bartsiotas, 2014).

2.8.5. Summary of Mitigation Measures for Controlling Delays and Cost Overrun in Road Construction Projects

Building construction project delays and cost overruns, have been a major setback in the last decades, especially in developing countries. This is due to the fact that; keeping building construction projects within estimated costs and schedules, requires sound strategies, good practices, and careful judgment. Moreover, asserts that; there are steps which can be taken to

minimize their causes and effects of delay and cost overrun, as long as they are identified, and countermeasures are taken. These can be summarized as shown in Table 2.2, which show the mitigation measures on dealing with delays and cost overruns in building construction project, (Jaffari S. Jongo¹ , Dennis N. G. A. K. Tesha, et al.,, 2019).

Table 2. 4 Summary of mitigation measures against delays and cost overrun as retrieved from different literature review

S. No	Mitigation Measures against Delay and Cost Overrun	Sources
01	Accurate cost estimation	1) Kamaruzzaman, S. & Ali, A. (2010), Cost Performance for Building Construction Projects in Klang Valley, In the Journal of Building Performance, Vol.(01)(01), 110 - 118. 2) Kesavan, M., Gobidan, N.N., & Dissanayake, P.B.G., (2015); “Planning & Mitigation Methods to Reduce the Project Delays in Sri Lankan Civil Engineering Construction Industries”, A Paper Presented During the 6th International Conference on Structural Engineering and Construction Management, (ICSECM), Kandy, Sri Lanka, 11th – 13th December, 2015, Page 102 to 107.
02	Allocate adequate contingency allowances	Enshassi, A, Al-Najjar, J, & Kumaraswamy, M. (2009a); Delays and Cost Overruns in the Construction Projects in the Gaza Strip, In the Journal of Financial Management of Property and Construction, Vol.(14)(02), 126 - 151.
03	Adopt clear information and communication channel	Danso, H. & Antwi, J. (2012); Evaluation of the Factors Influencing Time and Cost Overruns in Telecom Tower Construction in Ghana, In the Journal of Civil and Environmental Research, Vol.(02)(06), 15 - 24.
04	Adopt effective and efficient material procurement system	Aziz, R. (2013); Factors Causing Cost Variation for Constructing Wastewater Projects in Egypt, In The Alexandria Engineering Journal, Vol.(52)(01), 51 - 66.

05	Allocate sufficient time and finance (money)	Koushki, P, Al-Rashid, K. & Kartam, N. (2007); Delays and Cost Increases in the Construction of Private Residential Projects in Kuwait, In the Journal of Construction Management and Economics, Vol.(23)(03), 285 - 294.
06	Application of professional construction management (CM)	Koushki, P, Al-Rashid, K. & Kartam, N. (2007); Delays and Cost Increases in the Construction of Private Residential Projects in Kuwait, In the Journal of Construction Management and Economics, Vol.(23)(03), 285 - 294.
07	Appointment of competent site manager	Assaf, S.A. & Al- Hejji, S. (2006); Causes of Delays in Large Construction Projects, In the International Journal of Project Management, Vol.(24)(04), 349 - 357.
08	Appropriate scope definition	1) Kaliba, C, Muya, M, & Mumba, K. (2009); Cost Escalation and Schedule Delays in Road Construction Projects in Zambia, In the International Journal of Project Management, Vol. (02)(05), 522 - 531. 2) Kamaruzzaman, S. & Ali, A. (2010), Cost Performance for Building Construction Projects in Klang Valley, In the Journal of Building Performance, Vol.(01)(01), 110 - 118.
09	Approval projects from relevant parties	Marzouk, M.M. & El-Rasas, T.I. (2014); Analyzing Delay Causes in Egyptian Construction Projects, In the Journal of Advanced Research, Vol.(05)(01), 49 - 55.
10	Choose experienced subcontractor with good reputation	Shibani, A., & Arumugam, K., (2015); “Avoiding Cost Overruns in Construction Projects in India”, in the Journal of Management Studies, Vol.(03),(07-08), 192 - 202,

		David Publishing, (DOI: 10.17265/2328-2185/2015.0708.003).
11	Close monitoring	Danso, H. & Antwi, J. (2012); Evaluation of the Factors Influencing Time and Cost Overruns in Telecom Tower Construction in Ghana, In the Journal of Civil and Environmental Research, Vol.(02)(06), 15 - 24.
12	Competent architectural and engineering designs	Kamaruzzaman, S. & Ali, A. (2010), Cost Performance for Building Construction Projects in Klang Valley, In the Journal of Building Performance, Vol.(01)(01), 110 - 118.
13	Competent project manager	Doloi, H. (2011); Understanding Stakeholders' Perspective of Cost Estimation in Project Management, In The International Journal of Project Management, Vol.(29)(05), 622 - 636.
14	Comprehensive contract administration	Danso, H. & Antwi, J. (2012); Evaluation of the Factors Influencing Time and Cost Overruns in Telecom Tower Construction in Ghana, In the Journal of Civil and Environmental Research, Vol.(02)(06), 15 - 24.
15	Conducting a process mapping exercise	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
16	Contractors should improve their project management skills and articulate their resources	Nawaz, T, Shareef, N.A. & Ikram, A.A. (2013); Cost Performance in Construction Industry of Pakistan, In the Journal of Industrial Engineering Letters Vol.(03)(02), 19-33.
17	Control the design change	Pai, S.K. & Bharath, J.R. (2013); Analysis of Critical Causes of Delays in Indian Infrastructure Projects, In the

		International Journal of Innovative Research and Development, Vol.(02)(03), 251 - 263.
18	Design changes should be adequately highlighted and updated on all relevant project documentation	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
19	Designing the project to a great detail at the onset whenever possible	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
20	Develop strategy for solving identified risk.	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
21	Developing project programme based on experienced planners.	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
22	Development of comprehensive financial plan and cash flow.	Nawaz, T, Shareef, N.A. & Ikram, A.A. (2013); Cost Performance in Construction Industry of Pakistan, In the Journal of Industrial Engineering Letters Vol.(03)(02), 19-33.
23	Development of cost monitoring and periodic reporting of critical and long lead items.	Danso, H. & Antwi, J. (2012); Evaluation of the Factors Influencing Time and Cost Overruns in Telecom Tower Construction in Ghana, In the Journal of Civil and Environmental Research, Vol.(02)(06), 15 - 24.
24	Developing good monitoring and controlling system	Marzouk, M.M. & El-Rasas, T.I. (2014); Analyzing Delay Causes in Egyptian Construction Projects, In the Journal of Advanced Research, Vol.(05)(01), 49 - 55.

25	Develops realistic planning and scheduling for the project	Marzouk, M.M. & El-Rasas, T.I. (2014); Analyzing Delay Causes in Egyptian Construction Projects, In the Journal of Advanced Research, Vol.(05)(01), 49 - 55.
26	Effective coordination between parties involved	1) Enshassi, A, Al-Najjar, J, & Kumaraswamy, M. (2009a); Delays and Cost Overruns in the Construction Projects in the Gaza Strip, In the Journal of Financial Management of Property and Construction, Vol.(14)(02), 126 - 151. 2) Kesavan, M., Gobidan, N.N., & Dissanayake, P.B.G., (2015); “Planning & Mitigation Methods to Reduce the Project Delays in Sri Lankan Civil Engineering Construction Industries”, A Paper Presented During the 6th International Conference on Structural Engineering and Construction Management, (ICSECM), Kandy, Sri Lanka, 11th – 13th December, 2015, Page 102 to 107.
27	Effective financial management and control	Memon, A.H., Rahman, I.A. & Azis, A.A.A. (2011); “Preliminary Study on Causative Factors Leading to Construction Cost Overrun”, in the International Journal of Sustainable Construction Engineering & Technology, Vol.(02)(01).
28	Effective planning and scheduling	Memon, A.H, Rahman, I.A. & Azis, A.A.A. (2013a); Assessing Causal Relationships Between Construction Resources and Cost Overrun Using PLS Path Modeling Focusing in Southern and Central Region of Malaysia Material Resource, In the Journal of Engineering and Technology, Vol.(04)(01), 67 - 77
29	Enough number of labour	Pai, S.K. & Bharath, J.R. (2013); Analysis of Critical Causes of Delays in Indian Infrastructure Projects, In the

		International Journal of Innovative Research and Development, Vol.(02)(03), 251 - 263.
30	Ensure there adequate time to complete the work	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
31	Ensure design changes are reasonable timed when possible	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
32	Ensuring prompt resolution to design change quarries, issues and authorisation	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
33	Ensuring the time and cost implication of design change are always determined and agreed	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
34	Having a design manager to responsible for the design changes	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
35	Having enough resources to deal with the complexity	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
36	Hire competent labour	Gunduz, M., Nielsen, Y. & Özdemir, M. (2013); Quantification of Delay Factors Using the Relative Importance Index Method for Construction Projects in

		Turkey, In the Journal of Management in Engineering, Vol.(29)(02), 133 - 139.
37	Incentive schemes	Assaf, S.A. & Al- Hejji, S. (2006); Causes of Delays in Large Construction Projects, In the International Journal of Project Management, Vol.(24)(04), 349 - 357.
38	Making the risk register is a live document that is updated regularly	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
39	Must ensure the timely availability of required finance	Koushki, P, Al-Rashid, K. & Kartam, N. (2007); Delays and Cost Increases in the Construction of Private Residential Projects in Kuwait, In the Journal of Construction Management and Economics, Vol.(23)(03), 285 - 294.
40	Advance thought on permission from law enforcement agencies to beef up on site security	Ameh, O, Soyingbe, A & Odusami, K.T, (2010); Significant Factors Causing Cost Overruns in Telecommunication Projects in Nigeria, In the Journal of Construction in Developing Countries, Vol. (15)(02), 49 - 67.
41	Plan a time schedule for delivery process	Memon, A.H, Rahman, I.A. & Azis, A.A.A. (2013a); Assessing Causal Relationships Between Construction Resources and Cost Overrun Using PLS Path Modeling Focusing in Southern and Central Region of Malaysia Material Resource, In the Journal of Engineering and Technology, Vol.(04)(01), 67 - 77
42	Producing design document at time	Pai, S.K. & Bharath, J.R. (2013); Analysis of Critical Causes of Delays in Indian Infrastructure Projects, In the International Journal of Innovative Research and Development, Vol.(02)(03), 251 - 263.

43	Progress payment of subcontractor/suppliers must be made on time	Memon, A.H, Rahman, I.A. & Azis, A.A.A. (2013a); Assessing Causal Relationships Between Construction Resources and Cost Overrun Using PLS Path Modeling Focusing in Southern and Central Region of Malaysia Material Resource, In the Journal of Engineering and Technology, Vol.(04)(01), 67 - 77
44	Promote open communication	Nawaz, T, Shareef, N.A. & Ikram, A.A. (2013); Cost Performance in Construction Industry of Pakistan, In the Journal of Industrial Engineering Letters Vol.(03)(02), 19-33.
45	Promote team building communication process	Kaliba, C, Muya, M, & Mumba, K. (2009); Cost Escalation and Schedule Delays in Road Construction Projects in Zambia, In the International Journal of Project Management, Vol. (02)(05), 522 - 531.
46	Prompt progress payment from clients	Pai, S.K. & Bharath, J.R. (2013); Analysis of Critical Causes of Delays in Indian Infrastructure Projects, In the International Journal of Innovative Research and Development, Vol.(02)(03), 251 - 263.
47	Proper motivation and safety system	Enshassi, A, Al-Najjar, J, & Kumaraswamy, M. (2009a); Delays and Cost Overruns in the Construction Projects in the Gaza Strip, In the Journal of Financial Management of Property and Construction, Vol.(14)(02), 126 - 151.
48	Provide training to unskilled workers based on the scope of work	1) Enshassi, A, Al-Najjar, J, & Kumaraswamy, M. (2009a); Delays and Cost Overruns in the Construction Projects in the Gaza Strip, In the Journal of Financial Management of Property and Construction, Vol.(14)(02), 126 - 151. 2) Pai, S.K. & Bharath, J.R. (2013); Analysis of Critical Causes of Delays in Indian Infrastructure Projects, In

		the International Journal of Innovative Research and Development, Vol.(02)(03), 251 - 263.
49	Quick design approval	Nawaz, T, Shareef, N.A. & Ikram, A.A. (2013); Cost Performance in Construction Industry of Pakistan, In the Journal of Industrial Engineering Letters Vol.(03)(02), 19-33.
50	Quickly informed relevant parties when unforeseen circumstances affect the programme/ lead-in time	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
51	Reliable contractor	Pai, S.K. & Bharath, J.R. (2013); Analysis of Critical Causes of Delays in Indian Infrastructure Projects, In the International Journal of Innovative Research and Development, Vol.(02)(03), 251 - 263.
52	Safety and health program	Nawaz, T, Shareef, N.A. & Ikram, A.A. (2013); Cost Performance in Construction Industry of Pakistan, In the Journal of Industrial Engineering Letters Vol.(03)(02), 19-33.
53	Select experienced and cable subcontractor	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
54	Selecting a consultant who has sufficient experiences in similar nature of works and has good reputation	Olawale, Y. & Sun, M. (2010); Cost and Time Control of Construction Projects: Inhibiting Factors and Mitigating Measures in Practice, In the Journal of Construction Management and Economics, Vol.(28)(05), 509 - 526.
55	Team work between the client (owner) and architects in completing the design drawings before project	Ramabhadran, M., (2018); “An Investigation into Cost Overrun in Construction Projects in United Arab Emirates”, in the International Journal of Construction Engineering and Management, Vol.(07)(01), 01 - 21,

	estimate are prepared or the contract is awarded	Published by Scientific & Academic Publishing, (DOI: 10.5923/j.ijcem.20180701.01).
56	Subcontractor with enough experience and capability in dealing with the project complexity	Shibani, A., & Arumugam, K., (2015); “Avoiding Cost Overruns in Construction Projects in India”, in the Journal of Management Studies, Vol.(03),(07-08), 192 - 202, David Publishing, (DOI: 10.17265/2328-2185/2015.0708.003).
57	Efficient management of site and supervision of the project	Kesavan, M., Gobidan, N.N., & Dissanayake, P.B.G., (2015); “Planning & Mitigation Methods to Reduce the Project Delays in Sri Lankan Civil Engineering Construction Industries”, A Paper Presented During the 6 th International Conference on Structural Engineering and Construction Management, (ICSECM), Kandy, Sri Lanka, 11 th – 13 th December, 2015, Page 102 to 107.

Source: Adapted from (Luvara G.M.V., Phoya, et al (2018)); modified by Authors, (2019), (Jaffari S. Jongol , Dennis N. G. A. K. Tesha, et al., 2019), and reviewed by the researcher, 2022.

2.8.6. Communication among Construction Project Stakeholders

Communication skills are essential to produce effective communication however if the speaker lacks of these skills then poor communication may result. Interpersonal skills which include communication skills play an important role for the success of a project. Parties involved in construction possess different communication skills which also depends on their qualification and cultural background. These differences cause concurrent misunderstanding in the delivery stage.

In construction industry, communication is managed by channels in all the organizations hence each department or section in the organization is responsible of disseminating the related information to formulate complete communication system. However due to the complexity in construction industry several concurrent communication problems occur because no proper channeling is adopted to manage and control the communication process. Lee & Bernold reported that effective communication in construction is seriously hampered due to a lack of appropriate data channels, improper channel and inaccurate data transfers. Tipili et al stated that, unclear

channels of communications result in project delay. It is therefore very important to standardize the channels of communication in construction industry to fasten and ease the communication process (Yaser Gamil and Ismail Abdul R., 2017).

2.8.6.1. Building Communication Strategies among Construction Projects Stakeholders

We all communicate, consciously or unconsciously through words facial expressions, gestures and other actions: this is part of being human. Effective communication is more than putting data into templates and reports. The strategy for targeted communication depends on the type of communication, and consideration of the information needs of the stakeholder as well as of the project and project team, (Lynda Bourne , 2016).

The crucial aspects of effective communication are:

- The kind of discussion and special strategies to make certain the information achieves its planned aims
- Clarity at the motive of the communication: defining the aim.
- Refining the message via factoring in what is understood approximately stakeholders for instance their stake or concern, group, character and gender – personalizing the message.
- Capacity to monitor and measure the effectiveness of the communication: ensuring that the planned communication is carried out and measuring the effectiveness of that communication.

2.8.6.2. Types of Construction Projects Stakeholder Communication

There are three general classes of project communication: reporting, PR (project relations marketing) and directed communication. Both reporting and PR are essential for project success, they are not the focus of this paper, so will just be mentioned briefly.

Reporting is the standard communication that provides information about the project. Even if the reports are never read, they provide reassurance that the project manager is well-organized, able to plan and implement the necessary project processes and practices and is also equipped to deal with the unexpected. These reports are usually mandated by the organization: they are not the subject of this paper.

Project relations (PR) or project marketing includes all of the broadcast communications needed to provide information about the project to the wider stakeholder community. Intelligent use of PR

can result in far lower levels of apathy or opposition, and can increase support if only through the recognition factor that such a branding exercise provides.

Directed communication is focused on the important stakeholders (both positive and negative) identified through the 5-step process of the Stakeholder Circle, as needing information in addition to the regular reporting regime. Directed communication needs to be planned, to include the purpose of the communication, understanding of characteristics of the receiver, their expectations of the project outcomes may be relevant to achieving the best outcomes for the project. Some useful tactics include: (Lynda Bourne , 2016).

- WIFM – ‘what is in it for me’ – to align the needs of the project with the expectations of the stakeholder (or group).
- Involving other supportive stakeholders who are colleagues of the unsupportive stakeholder. Their advocacy for the work of the project and their assistance in delivering the message will be invaluable.
- Using networks to build peer pressure through the stakeholder’s network of contacts.
- Delivering information incrementally in a carefully planned way. Anecdotally, any message must be repeated at least three times for it to achieve its intended outcome.
- Making as much information as possible easily accessible, and using multiple channels to deliver the information.

Directed communication that is targeted to build a stronger relationship between the project and its stakeholder community provides the additional ‘fire-power’ needed to engage important stakeholders who are not engaged to the level necessary for project success, (Lynda Bourne , 2016).

2.8.6.3. Purpose of Communication

When targeted communication is intended for senior stakeholders, it is essential to first state the purpose of the message. This signals that the project team recognizes that the stakeholder is ‘time poor’ and that by clearly stating the purpose they are helping to ready the recipient for the information that follow. The purpose of the communication can be: (Lynda Bourne , 2016)

- To ensure that the stakeholder has access to essential or useful information
- To reduce anxiety in change situations
- Giving bad news, providing negative or positive feedback

- Problem solving or issue resolution
- For individual or team motivation.

2.8.7. Value Engineering

2.8.7.1. Definition

Value Engineering (VE) is a management technique that seeks the best functional balance between cost, reliability and performance of a product, project, process or service. Value engineering is a powerful problem-solving tool that can reduce costs while maintaining or improving performance and quality requirements. Value engineering can improve decision-making that leads to optimal expenditure of owner funds while meeting required function and quality level 2. The success of the VE process is due to its ability to identify opportunities to remove unnecessary costs while assuring quality, reliability, performance, and other critical factors that meet or exceed customers' expectation, (K. Ilayaraja and MD. Zafar Eqyaabal, 2015).

2.9. Policy and Strategy Review

2.9.1. Policy Review

The national policy priorities set out in a new ten-year perspective plan and the three-year Homegrown Economic Reform provide guidance and direction for design and implementation of the United Nations sustainable development cooperation framework and for WFP. Recommendations from recent reviews, assessments and evaluations include solidifying WFP's work at the humanitarian–development–peace nexus, leveraging social protection as an entry point for innovations in resilience building and nutrition improvement, and expanding investments in livelihoods, emphasizing equitable access to water and markets for food-insecure people. Implementation of the interim country strategic plan has revealed new challenges and opportunities for WFP such as those in enhancing partnerships for school feeding and nutrition, expanding capacity strengthening efforts at the regional level, and strengthening monitoring and accountability in relief and nutrition activities. Also evident is WFP's capacity to boost the efficiency and equity of Ethiopia's food assistance system and broader food industry through partnerships in the analysis and operation of logistics and supply chain management, (World Food Program, 2020).

Policy is a plan of action, statement of aims and ideas. When a policy is made by a business organization; it is called business policy, when made by a government organization, it is called

public policy, etcetera. Policy is generally used to refer to general guides to actions and decisions within the organization. According to Akanwa, et al (2006) the term policy, then, evolves from strategy and includes the procedures, rules, and methods which are used in the implementation of strategic decision. Every organization has objectives to achieve. Objectives are something to aim at, although they should be regarded as a road map rather than as a target at a rifle range, and the organization will not always find that the shortest distance is a straight line and may therefore plan for ways to avoid any obstacle. To do so, it must have a policy and strategy as well as the implementation of such policy and strategy, (John Nkeobuna Nnah Ugoani, 2020).

2.9.2. Strategy Review

Strategy may be defined as executive behavior whose purpose is to achieve organizational success or goals in a competitive environment. Implementation of business policy and strategy therefore serves basically to balance organizational objectives with performance. The management of strategic behaviour in terms of business policy and strategy implementation is an important executive responsibility. This is imperative because the selection requires the chief executive officer (CEO) to employ conceptual, observational and analytical skills to achieve and sustain organizational effectiveness. To ensure strategic balancing (SB) between objectives and performance the CEO must demonstrate requisite skills to integrate enterprise vision, mission and performance (Onuoha, 1991, Edeja, 2011), (John Nkeobuna Nnah Ugoani, 2020).

The traditional criteria for determining a project success are evident in the golden triangle of time, cost and quality (PMI, 2000). The argument here is that the criteria apply primarily to the work of the project and are defined solely from the point of view of the contractor. They neither address the wider issues of the investment and business case, nor the vested interest of stakeholders which is related to the performance of the building. Based on the research undertaken between the 1960's and the 1980's in the United Kingdom, Turner (1993) as cited in Bowen (2015), distilled a more complete set of criteria for performance measurement in construction. He proposes, therefore, a set of project success criteria as follows:

- It achieves the stated business purpose;
- It provides satisfactory benefit to the owner;
- It satisfies the needs of the owner, users and stakeholders;
- It meets its pre-stated objectives to produce the facility;

- The facility is produced to specification, within budget and on time; and,
- The project satisfies the needs of the project team and supporters.

Having proposed a more complete set of pro-forma criteria, Turner made a number of important observations concerning their nature and utility:

- Most of the criteria are subjective, with only time and cost being objective;
- The judgment is affected by the assessor's covert objectives;
- The measures are not necessarily compatible, so judgment depends on a complex balance. Relatedly, they are not mutually exclusive, so it is possible to satisfy them together;
- The measures are not judged simultaneously. They cannot, therefore, be forced to be compatible at the end of the project. For example, the first two measures are unlikely to be fully assessed until sometime after commissioning and the product is in use, (William Akoto Oppong, 2019).

2.10. Best Experience and Lesson Learnt

2.10.1. The Best Experience the Researcher Gained

The researcher gained the best experiences of road construction projects poor contract administration causes, impacts and mitigation measures through this research paper from different reviewed literatures in order to improve the contract administration processes. The researcher understands numerous success and failure of road construction projects parameters those has be fulfilled from the contract award to contract close out. Also the researcher tried to develop contract administration conceptual framework in road construction projects. The researcher gained the following experiences:

- How to assess the root causes of poor contract administration in road construction projects and what are them.
- How to identify the impacts of poor contract administration in road construction projects and what are them.
- How to determine the mitigation measures of poor contract administration in road construction projects in order to improve the existing problem and what are them.
- How to quickly find contracts and information, for saving valuable time
- How to build a comprehensive understanding of contract obligations

- How to identify contract risks such as non-compliance
- How to improve control mechanisms of poor contract administration and only work from accurate documents.

2.10.2. Lesson Learnt

The researcher learn the motives of contract administration causes, impacts and mitigation measures through this research paper from different reviewed literatures in order to realize knowledge of contract administration processes. At the end of this research paper the researcher was be able to understand:

- The major causing factors of poor contract administrations in construction projects
- The setting impacts of poor contract administrations in construction projects
- The selective mitigation measures of poor contract administration in construction projects to use as occurred contract administration problem control mechanism.
- The parameters of construction projects contract administration to be fulfilled for compliance of obligations of the parties to the contract.
- The monitoring and performance of contract administration in construction projects

2.11. Conceptual Framework

A Description of how the variables related to one another is provided as below by the conceptual framework. The independent and dependent variables are the key variables. The Independent Variables are Contract Administration, Scope Management, Organizational Structure, Contract Monitoring and Control, and Contract Close Out; while Performance of Road Project is the Dependent Variable in this research work. To ascertain which variable alters the relationship between the independent and dependent variables, so it is assessed and subjected to manipulation. Contract Monitoring and Control is recognized as mitigating factors. Many performance indicators, expressed by aspects like quality, time, cost, including Scope of project as additional factor could be used to investigate and assess the performance of road construction projects.

Independent Variables

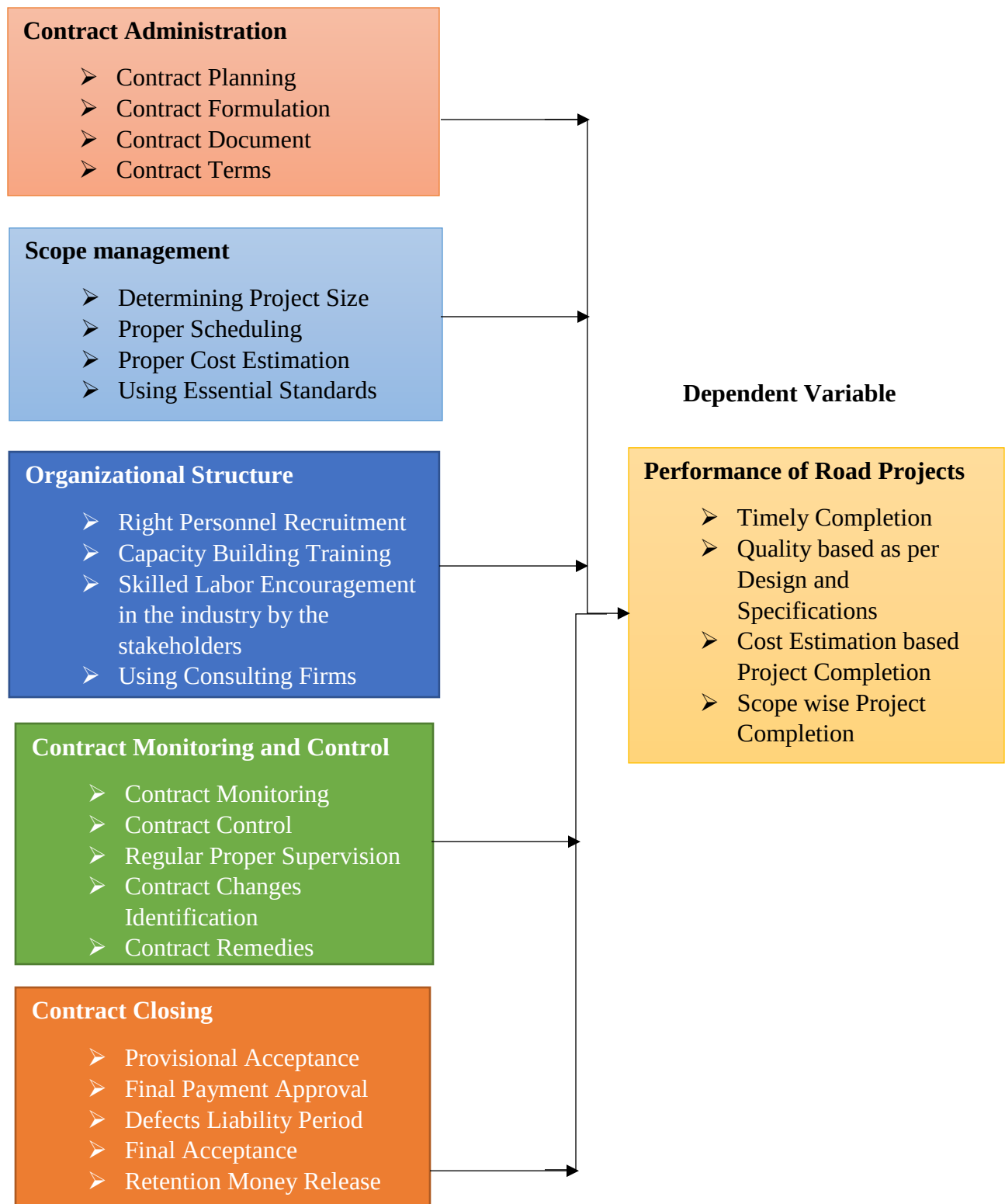


Figure 2.2: Conceptual Framework

Source: The Researcher, 2022

2.12. The Research Gap

The review of the literature discovered the subsequent key results:

- Enormous cause and impact factors are taken into consideration in an extraordinary researches, however, those cause and impact factors are restricted to the geographic scope and varieties of projects with organizational and cross-cultural perspectives.
- Though numerous studies has been performed for decades, construction poor contract administration is a growing and ongoing process.
- To date, no high-quality principle or device for assessing the compounded effects of construction poor contract administration on projects goals has been advanced or proposed.
- To comprehensively recognize the cause and impact of poor contract administration, it is useful to distinguish its causes and impacts in addition to its mitigation measures.

Several strategies encompass this principle, however they nonetheless deal with a single cause or impact in order to simplify the problem. Many of those methodologies in reviewed varieties of literature independently evaluated the occurrences of cause and impact factors, and awareness on an evaluation of distinct causes and impacts that failed to consider the interactions of various causes and impacts with its opposing mitigation measures.

- The majority of current cause and impact assessment contributions have simply brought cause and impact which depends on project parameters like cost, time and quality rather including scope of the projects.
- Cause and impact factors have interdependence with every different and hard to expect and manipulate the interrelationship among extraordinary causes and impacts.

However, no appropriate strategies are proposed and advanced; thus far to take into considerations those factors in aggregate and alternatively studied one at a time with the variety of have a look at.

CHAPTER THREE

3. RESEARCH MATERIALS AND METHODOLOGY

3.1 Introduction

This chapter discusses the line approach of the study. The first aspect deals with the research type/method, design, approach, and philosophy and population and sample of the study. The second part provides the tools and techniques employed in the research. It also presents the procedure of the study. The whole plan of the study is discussed in detail under this chapter. Administration of tools and scoring procedure are reported systematically. All these were used in order to achieve the research objectives.

3.2 Research Type/ Method

The type of this research is quantitative and qualitative as well as inferential statistics in its behavior. The methodology used in formulating this study was a targeted questionnaire survey and case study based on the contract administration procedures assessment. The researcher used a questionnaire survey strategy to study the significance of the recognized components on the causes and impacts of poor contract administration in road construction projects through the simple random sampling method among the West Arsi Zone Road Construction projects Stakeholders; specifically, Clients' professionals from 3 selected Woredas' under the Zonal Road Office (namely; Wondo, Negele Arsi, and Shashemene Woreda Road Offices), the Zonal Road Office and Zonal Regulatory Bodies' (West Arsi Zone Construction Authority) Office professionals and Contractors' professionals were targeted as the focus group of this research study. The study was performed based on manipulated direct hand in questionnaire survey and a case study of selected projects by assessing their archival documents from the client office with its full information.

3.3. Research Design

This study was conducted through questionnaire survey and case study design. Questionnaire survey part is inferential where the case study design is the intensive descriptive and holistic analysis of a single entity or a bounded case. The case study design is ideally suitable for this study because it will enable an in-depth analysis of the problem in contract administration on roads construction projects in West Arsi Zone. A questionnaire was developed to assess the

perceptions of clients, consultants, and contractors on the relative importance of causes and impacts of poor contract administration in Ethiopian construction industry.

3.4. Research Approach

The first step of the method involved a review of the existing contract administration process from different sources of documentations that led to the identification of research questions, setting out the study objectives and identification of the appropriate sets of tools for achieving the objectives. Various tools were used to collect primary and secondary data relevant to the objectives of the study. These research tools were selected on the basis of the encompassed of the data they could provide to achieve the set forth study objectives. The limitation of the resources available for the study was also considered while selecting these tools.

3.5. Research philosophy

Research philosophy is an important part of research methodology. Research philosophy is classified as ontology, epistemology and axiology. These philosophical approaches enable them to decide which approach should be adopted by the researcher and why, which is derived from research questions (Saunders, Lewis, & Thornhill, 2009). The important assumptions are present in research philosophy which explains the researcher's view regarding the world. These assumptions will determine the research strategy and the methods of that strategy, (Susweta G.Thakurta & Priya Chetty, 2015).

The researcher dictates the line of the research approach starting from the introduction chapter and finalizing it on conclusion and recommendation chapter. In this section the researcher highlights the concepts of the with the relevancy of the research tittle; including the research problem contextually as well as plotting the purpose of the research to answer the raised research questions following the targeted hypothesis of the research. In this section the researcher also tried to give description about the scope of the study from the three perspectives; such as thematic, spatial and temporal scopes and limitation of the study based on the research problem. In the second chapter, the researcher reviewed different literatures from different journal articles, research articles, conference proceedings, reports, books, etc., and also tried to write a research gap accordingly. Again in the third chapter the researcher used different research methods and methodologies to realize the research approaches in the study to determine research design, approach, types, methods, and sampling frame, target population, sample size, data collection techniques, data

analysis and validity and reliability instruments were discussed through this chapter. Then in the fourth chapter the researcher tried to analysis and discuss the data in the research findings for more interpretation and presentation of the results. In this section the researcher give interpretation and presentation of data from the findings to arrive at conclusion and recommendation. At the end chapter the researcher conclude the findings with short elaboration from the interpreted and presented results and give the recommendation for the concerned body to show the direction as the researcher.

3.6. Study Location

The study was conducted in West Arsi Zone, Oromia regional state, the southern part of the Arsi zone. This zone is named after a subgroup of the Oromo, who inhabit it and the administrative center of this zone is Shashamane. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this zone has a total population of 1,964,038 of whom 973,743 are men and 990,295 women. 272, 084 or 13.85% of population are urban inhabitants. Its geographical coordinates are between 7°17'North latitude and 38°39'16''East longitude.

3.7. Sampling Frame

The sampling frame is the list of population from which the samples were drawn. No single appropriate method of the sample selection for such type of research was found. So, it was done on the basis of unbiased theory. While fixing the sample size the accuracy of the results found, the cost of the research works, homogeneity of the population and other related factors were considered. West Arsi Zone of Oromia Regional state has 13 Woredas where different construction projects have been undertaken for social benefit and economic development in the region. Using Systematic Random sampling techniques, Road construction projects performed in all Woredas were identified for investigation. Identification and categorization of the causes and impacts of poor contract administration on road construction projects were recognized and evaluated using a literature review, and questionnaire survey with construction stakeholders (clients', contractors, and regulatory bodies' professionals) in the Zone. Forty-six (46) causes, twenty-two (22) Impacts and twenty-three (23) Mitigation measures factors; on Investigating cause and Impacts of poor contract administration on road construction projects were identified. The questionnaire was developed to evaluate the frequency of identified problems with the five-point scale of ordinal measures i.e., Likert scale. A total of 77 questionnaires were distributed to

construction professionals working on specific road projects in all places, and 70 questionnaires were returned (90.91%) from 77 distributed questionnaires. Using this research design, this study focused on acquisition of quantitative and qualitative data from different professional people involved in the road construction sector. The overall research process is: -

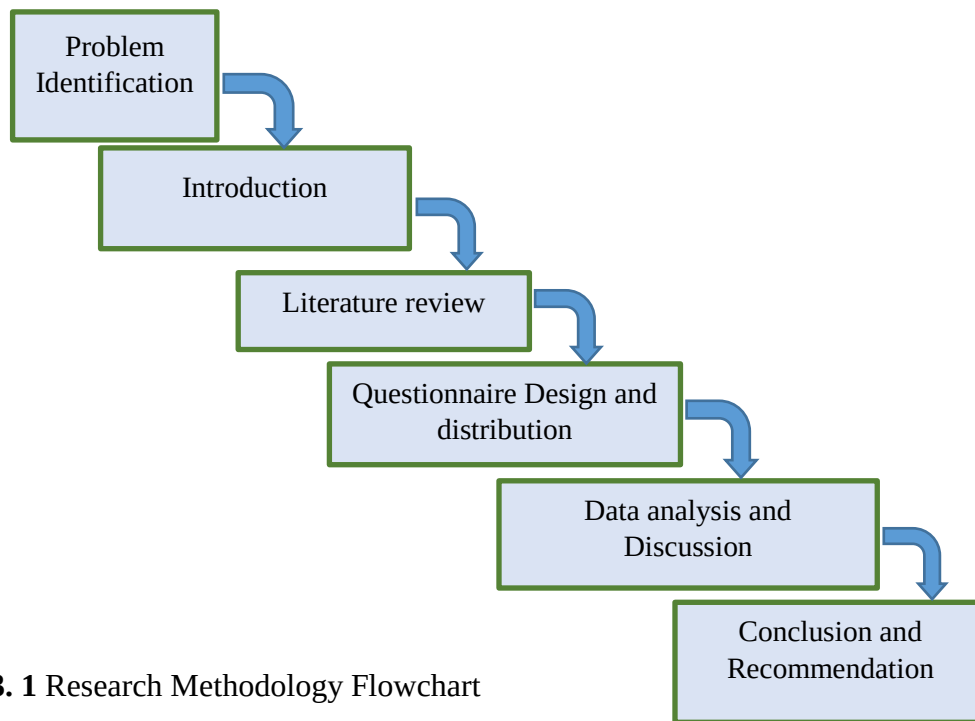


Figure 3. 1 Research Methodology Flowchart

3.8. Target Population

The target population of this research were 95 projects in West Arsi Zone Road Construction projects. The selected respondents are Stakeholders; specifically, Clients' professionals from 13 Woredas' under the Zonal Road Office. For the case study approach 3 (three) woredas' and 2 (two) Zonal offices were selected among woredas' of zone are (namely; Wondo, Negele Arsi, and Shashemene Woreda Road Offices), and Zonal Road Office and Zonal Regulatory Bodies' (West Arsi Zone Construction Authority) Office professionals and Contractors' professionals After determining the sample size, the above three (3) woredas' and two (2) Zonal Offices were selected among 13 woredas' professionals using systematic random sampling. The target populations in this study are professionals directly involved in the road construction and Zonal administration authority employees assigned to the road construction. Among the total number of projects using systematic random sampling the target population of 95 projects were selected as shown in Table 3.1 below:

Table 3. 1 Population Sample for the Study

Population Category	Sample respondents
Clients	30
Contractors	25
Regulatory body	22
Total	77

Source: The Researcher, 2022

3.9. Sample Size and Sampling Procedure

Sampling is selecting a given number of subjects from a defined population representative sampling of that population. From the target population of construction professionals involved in road construction projects and registered with zonal road authority and other participants, the researcher sent questionnaires to specific respondents working in specific woredas in West Arsi zone. The sample size of this population is calculated by using Yamen's (1967) simplified formula as follows.

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{95}{1 + 95(0.05)^2}$$

$$n = \underline{\underline{77}}$$

Where n, is the number of determined sample size

N, is the number of population for the sampling size and,

e, is the level of confidence which is 5%

So, that 77 professionals were taken to determine this sample of the research

The sampling procedure describes the list of all population units from which the sample were selected. In this study, 90.91% of the sample was considered. The technique applied so as to obtain a representative sample of 70 respondents when the population does not constitute a homogeneous group.

Table 3. 2 Sampling size of respondents in table form

Cluster	Distributed Questionnaires	Returned Questionnaires	Percentage
Clients	30	25	83.33%
Contractor	25	25	100%
Regulatory bodies	22	20	90.91%
Total	77	70	90.91%

Source: The Researcher, 2022

3.10. Sources of Data

To achieve the intended objective and to answer the research questions of the study, different sources of data will be used. As a primary data, questionnaire and case study on four (4) selected projects in the selected woreda' were used. To collect secondary data literatures, archival documents were used. To improve the validity of study findings, the combination of qualitative and quantitative methods adopted to study observational. Study questionnaire survey has both open ended and closed ended questionnaires. The respondents' documents were collected using questionnaires from contractor, client and regulatory bodies. Study questionnaire survey has both open ended and closed ended questionnaires. In this research the case study approach used archival documents mostly from projects not completed within contract time from contract documents, monthly reports, correspondence letters, payment certificates were investigated thorough which were very important in identifying the current problems related poor contract administration in Road construction projects.

3.11. Data Collection Techniques

After approval of the proposal by Adama Science and Technology University to collect data, the researcher starts to collect information from different Authority found in West Arsi Zone. Using the authorization letter from the University the researcher started the process of data collection after seeking permission from relevant road authorities and owners of construction and regulatory firms involved in the research. A research assistant was engaged to assist in data collection. Primary data collected through questionnaire to supplement the secondary data for the analysis of the qualitative part of the study, while secondary data gathered through review of working document, books, international journal and reviewing different documents of participants including monthly, fourth quarter and annual performance reports were collected to provide the

quantitative analysis of the research questions. The inferential statistics was used in this research work when analyzing the data.

The questionnaires to the respondents were administered on hand. Deliveries were carried out and followed up with reminders and personal collection was done by the researcher.

3.12. Data Analysis Methods

Data was collected, edited and coded. This was done to ensure consistency and uniformity in the processing of the data. Quantitative data was presented in tables and explanation presented in prose. Since the study was trying to investigate cause and impact of poor contract administration in road construction projects, IBM SPSS version 24 Software were used in aiding the analysis and presentation of the findings of the research. The percentages and frequencies were used in the analysis and the results were presented in tables. The statistical tool used to run the analysis was descriptive statistics and the Relative Important Index (RII) was used to rank the identified variables and used to determine the rank of performance problems, the factors that affect project performance and key performance indicators in road construction projects. This can be represented as:

$$\text{Relative Importance of Index (RII)} = \frac{1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5}{5(n_1 + n_2 + n_3 + n_4 + n_5)} \quad \text{equation 3.1}$$

Where, n_1 = number of respondents who answered Very High,

n_2 = number of respondents who answered High,

n_3 = number of respondents who answered moderate,

n_4 = number of respondents who answered low, and

n_5 = number of respondents who answered very low.

The RII values have a range of 0 to 1 (0 not inclusive). In comparing two factors, the factor which scores greater value of RII is more important than the other corresponding factor which scores low value of RII.

Correlation involves the measurement of association, or relationship, or correlation two variables to check ascertain whether they are positively or negatively associated, or no longer related in any manner by any means. Two Variables are associated if the modifications in a single variable have affect or influence the changes within the other variable. To measure association or relationship between variables we use correlation coefficients to express the degree of association or

relationship. In other words, correlation coefficients measure the strength (direction and magnitude) of association or relationship between two variables.

Correlation coefficients can be high or low (magnitude), and positive or negative (direction). Correlation coefficients vary from -1 to +1: while -1 and +1 indicate perfect negative and perfect positive correlation coefficients respectively, a correlation coefficient of zero implies that no correlation (zero relationship). Further, correlation coefficients lower than 0.4 (whether negative or positive 0.40), are said to be low, between 0.4 and 0.6 are moderate and above 0.6 are high, (OBILOR, Ezezi I, et al., 2018).

3.13. Data Measurement

In order to select the appropriate method of analysis, the level of measurement must be understood. For each type of performance challenges, there is/are an appropriate method/s that can be applied and not others. In this research, ordinal scales were used. Ordinal scales as shown in the Appendix questionnaire tables are a ranking or a rating data that normally uses integers in ascending or descending order. The numbers assigned on a Likert scale as (1, 2, 3, 4, 5) do not indicate that the interval between scales is equal, nor do they indicate absolute quantities. They are merely numerical labels based on Likert scale.

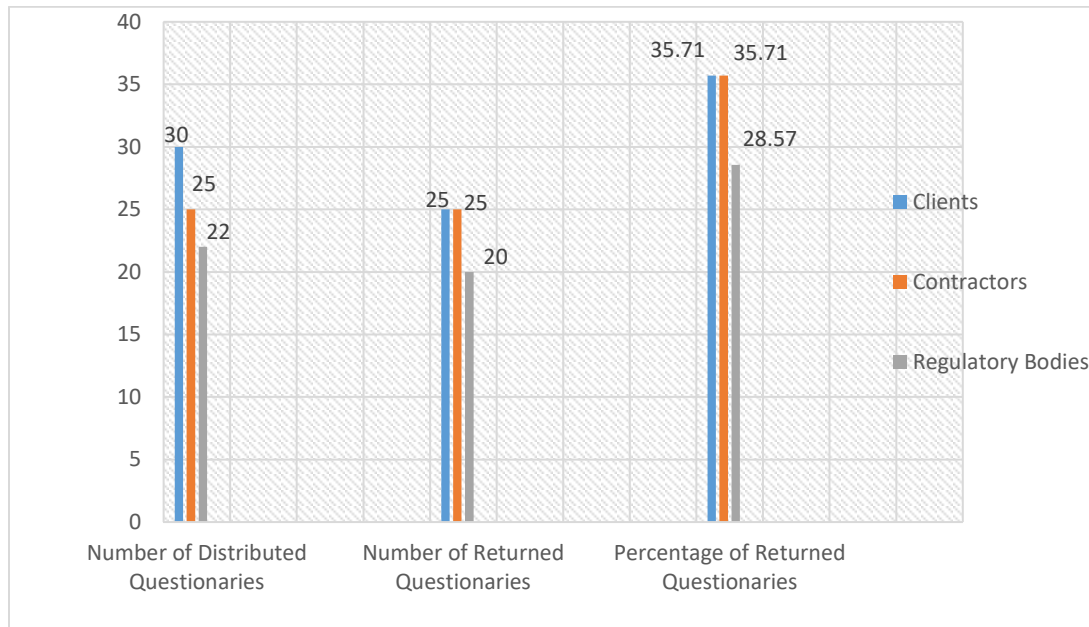
3.14. Research Instruments

The instruments to be used in this study were questionnaires survey and case study. Primary data was collected by the use of questionnaire survey and case study design. The questionnaire were divided into six sections: Section 1 which seeks to establish general information of the respondent; Section 2 which contained Cause of Poor Contract Administration in Road Construction Projects; Section 3 Impacts of Poor Contract Administration in Road Construction Projects; Section 4 which contained Mitigation measures to Improve the existing contract administration process in road construction projects. The structured questions will be used in an effort to conserve time and money as well as to facilitate in easier analysis as they are in immediate usable form. While the case was based on the archival documentations of the selected projects.

3.14.1. Questionnaire Survey

A Total of 77 questionnaires were distributed for 30 Client's representatives, 25 Road contractors and 22 Regulatory body. These questionnaires were filled by Contractors, Clients and Regulatory

bodies in selected organizations. 70 questionnaires were returned (90.91%) out-off 77 distributed questionnaires as follows: 25(35.71%) from Clients’ representatives, 25 (35.71%) from contractors and 20 (28.57%) from regulatory bodies as respondents. Figure 3.2 shows details of the responsiveness of the questionnaire.



Source: The Researcher, 2022

Figure 3. 2 The responsiveness rate of the questionnaire

3.14.2. Case Study Design

Potential direct causes and impacts of poor contract administration in road construction projects were identified through a questionnaire survey and literature review. Additionally, we used a case study strategy to identify the root causes and impacts of poor contract administration in road projects on West Arsi Zone road projects. As a result, some projects get started in 2012 and were not completed by their Maturity date. The case study focused mainly on the projects those have a problem with good governance and others that do not complete within their specified contract period. The road projects that faced a problem of good governance zone were 2 (two) in number while projects not completed in their contract period are 2 (two) and totally 4 (four) projects were selected as sample size for this case study. Well-reviewed facilities that were accepted as key cases were targeted because they could provide the necessary documentation for research. Three stakeholders like clients, contractors, and a regulatory body (Construction Authority) were selected due to their willingness to participate in the study. Moreover, lessons learned from these critical

cases can be logically generalized to the situation in West Arsi Zone Road Projects' running sectors. Documented evidence (contract agreements and amendments) from three cases from 2012 to 2022 was used in this study. Comparisons between cases were planned and maintained. Each case was therefore treated as unique to ensure that it retained its contextual individuality. Data collection and analysis procedures used the archival documents from interested offices to maintain this case study approach.

3.15. Validity and Reliability of Research Instruments

3.15.1 Validity of the Research Instruments

Validity is questionably the maximum important measures for take a look at high-quality. The phrase validity tends to whether or not or now not the test measures what it claims to degree. Validity is the quantity of which an idea, deduction or dimension is nicely-originated and relates precisely to the real world (Brains et al, 2011). The time period "legitimate" is on account of the Latin phrase "Validus", which means "sturdy". The validity of a dimension tool is contemplated to be the degree to which the device measures what it asserts to measure; in this case, the validity is stated to be equal to accuracy, (Said EL Hajjar Ahlia, University, 2018).

3.15.2 Reliability of Research Instruments

Reliability refers to the consistency of a measure. If equal result time is achieved and again the measure is taken into consideration reliable. For example, "if an assessment is designed to measure a trait (consisting of introversion), then each time the assessment is run to a topic, the consequences need to be approximately the equal" (Cherry, 2013, p. 1). It isn't always viable to calculate reliability precisely, but it could be anticipated in numerous approaches. Cronbach's Alpha- "Cronbach's alpha is a version of internal consistency reliability based totally at the average inter-object correlation of a tool" (Rovai, Baker, and Ponton, 2014, p. 545), (Kelly, 2014)

For an exploratory or pilot study, it is suggested that reliability should be equal to or above 0.60 (Straub et al., 2004). Hinton et al. (2004) have suggested four cut-off points for reliability, which includes excellent reliability (0.90 and above), high reliability (0.70-0.90), moderate reliability (0.50-0.70) and low reliability (0.50 and below) (Hinton et al., 2004). Although reliability is important for study, it is not sufficient unless combined with validity. In other words, for a test to be reliable, it also needs to be valid (Wilson, 2010).

Cronbach's Alpha was computed as follow;

$\alpha = k/k-1*[1-\sum (S^2)/ \sum S^2_{sum}]$ Where; k =Number of Response items, α = Cronbach's Alpha,

$\sum S^2$ =Variance of individuals Items summed up, $\sum S^2_{sum}$ = Variance of summed up scores

The following table 3.2 describes how different values of Cronbach's Alpha are usually interpreted in research data discussion.

Table 3. 3 Reliability Analysis of different values of Alpha Hinton et al. (2004)

Cronbach's Alpha	Internal Consistency
$0.9 \leq \alpha$	Excellent
$0.7 \leq \alpha < 0.9$	high reliability
$0.5 \leq \alpha < 0.7$	moderate reliability
$\alpha < 0.5$	low reliability

3.16. Ethical Consideration

The researcher was tried to make excellent certainty and integrity of this research work. The confidentiality and anonymity of the voluntary respondents were also guaranteed the researcher. This impartial and impractical research work was taken into consideration no longer to cause harmful effect to respondents in what so ever way. Every action and request to each respondent by the researcher was based on the voluntary support and help of the respondents.

CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSIONS

4.1 Introduction

This chapter discusses the interpretation and presentation of the data collected by means of questionnaires. The study aimed to investigate cause and impacts of poor contract administration in road construction projects in West Arsi Zone road construction projects, so as to obtain the objective of the study the data were examined and described.

Frequency distribution and tables were used to organize data, to give meaning to the response rates and the statistical tool used to run the analysis was descriptive statistics and the Relative Important Index (RII). The data was then presented through frequency tables and analyzed by IBM SPSS software and the researcher used Pearson Rank's Correlation Coefficient method because it's often used to evaluate relationships involving ordinal values.

4.2 Questionnaire Response Rate

The study generated 77 questionnaires which were administered to various categories of respondents and the results analyzed. Out of the 77 questionnaires distributed, 70 were returned giving a return rate of 90.91%. The questionnaire return rate results are shown in Table 4.1.

Table 4. 1 Response rate of the study

Participants	Questionnaire Distributed	Questionnaire Returned	Response Rate in (%)
Clients	30	25	83.33%
Contractors	25	25	100%
Regulatory bodies	22	20	90.91%
Total	77	70	90.91%

Source: The Researcher, 2022

From the combined result shown on table 4.1, a sample size of 77 respondents was the study target from which 70 filled in and returned the questionnaires with a rate response of 90.91%. This rate was acceptable to make conclusions for the study as it was considered representative. According to Gay (2001) in questionnaire survey research, a response rate of 10% - 40% is acceptable for

data analysis. The shortfall in the required sample size implies that, conclusions in the study may be considered as perception of the respondents only.

From the summarized table above, it can be said that enough questionnaire were returned to analyze the data and infer in this study since a rate of response of 90.91% is over 40% and exceptional when compared to the rate described above.

4.3 The Characteristics of Respondents

The characteristics of respondents observed in this study include current position in the organization, organization type, experience, level of education, and working within the road construction projects are taken as personal detail of the respondent. The review of these characteristics might give some insights as to why the answers of the respondents vary. Sample sizes of 70 respondents were taken and the following are their characteristics. The responses from the respondents are summarized in table 4.2.

Table 4. 2 Respondents Profile

			Frequency	Percentage (%)
1	Current Position in the Organization	Project Manager	19	27.1
		Highway Engineer	12	17.1
		Material Engineer	7	10.0
		Construction Engineer	18	25.7
		Structural Engineer	6	8.6
		Surveyor	4	5.7
		Construction Superintendent	2	2.9
		General Forman	2	2.9
2	Organization Type	Contractor	25	35.7
		Client	25	35.7
		Regulatory body	11	28.6
3	Experience	Below 5 Years	25	35.7
		5-10 Years	33	47.1
		11-15Years	12	17.1
		Above 15 Years	0	0.00
4	Level of Education	Diploma/level	7	10.0
		Bachelor's Degree	46	65.7
		Masters	17	24.3

		PHD	0	0
5	Working within Road Construction Projects	Less than a year	15	21.4
		1 - 3 years	18	25.7
		4-6 years	20	28.6
		7-9 years	11	15.7
		Above 9	6	8.6

Source: The Researcher, 2022

From the study results as shown in table 4.2 above as indicated on row number one, the respondents were requested to indicate the position in current organization. From the research findings, it was that noted that 27.1% working as Project Manager, 17.1% working as Highway Engineer, 10.0% working as Material Engineer, 25.7% working as Construction Engineers, 8.6% working as structural engineer, 5.7% working as surveyor, 2.9% working as Construction Superintendent and while 2.9% working as General Forman and these respondents are working within the Construction Industry. This implies that all respondents worked with various organizations which are engaged in road construction playing various roles which place them in a position of being capable of providing very reliable information in this research study.

The respondents were asked their organization type and they stated as above table 4.2 column four shows the study results, it was noted that 35.7 % of respondents were Contractors, and again 35.7% were Clients, where as 28.6% were regulatory bodies. This indicates that the clients and contractors' respondents have equivalent participation and it implies client to contractors' respondent's ratio is equal.

As determined in above table 4.2 row number three (3) the respondents were requested to indicate their experience in years that they were involved in construction industry; thus, from the study it was noted that 35.7% were involved in construction projects below five (5) years, 47.1% were involved for a period of 5-10 years, and 17.1% have been involved in construction projects for a period of 11-15years. This result implies that most respondents were involved in road construction projects for a significant time length which enable them to give reliable information to this study.

From the research findings as indicated on row number six (4) in the table 4.2, the study noted that 10.0% held Diploma/level, 65.7% of the respondents indicated to hold bachelor's degree, 24.3% of the respondents indicated to hold Master's degree, while 0% held PhD. This result shows that respondents were educated thus able to respond to research questions easily. It also indicates that the road construction industry is run by very well-educated professionals.

As indicated on row number five (5) in the table 4.2 above, the respondents were asked to indicate the how long they have been worked in road construction projects. As the results are shown in Table 4.2, the study noted that 21.4% were indicates worked for less than a year, 25.7% were worked 1-3 years, 28.6% were worked for 4-6 years, 15.7% were worked for 7-9 years and 8.6% were worked for above 9 years. It also indicates that the respondents with the 4-6 years are a bit experienced road construction industry particularly around West Arsi zone.

4.4 Root Cause Factors of Poor Contract Administration

The results of this part of study provides implication of relative importance index (RII) and rank of root cause factors of poor contract administration in road construction projects in West Arsi zone Road construction projects.

Table 4.3, figure 4.1 RII and Rank of root cause factors, based on three major parameters i.e., Cost, Time and Quality.

Table 4. 3 Respondents' RII and Rank of Cause Factors

S. No.	Root Cause Factors of Poor Contract Administration	RII (%)	Rank
	Quality Based		
1	Lack of Value engineering	75.71	4
2	Inadequate project Objectives	72.86	6
3	Lack of involvement in design of one or more parties to the contract	72	7
	Time Based		
4	Change in specification and design	79.43	2
5	Differing site conditions	77.71	3
	Cost Based		
6	Financial Problems	80	1
7	Errors and Omissions in design	75.43	5

Source: The Researcher, 2022

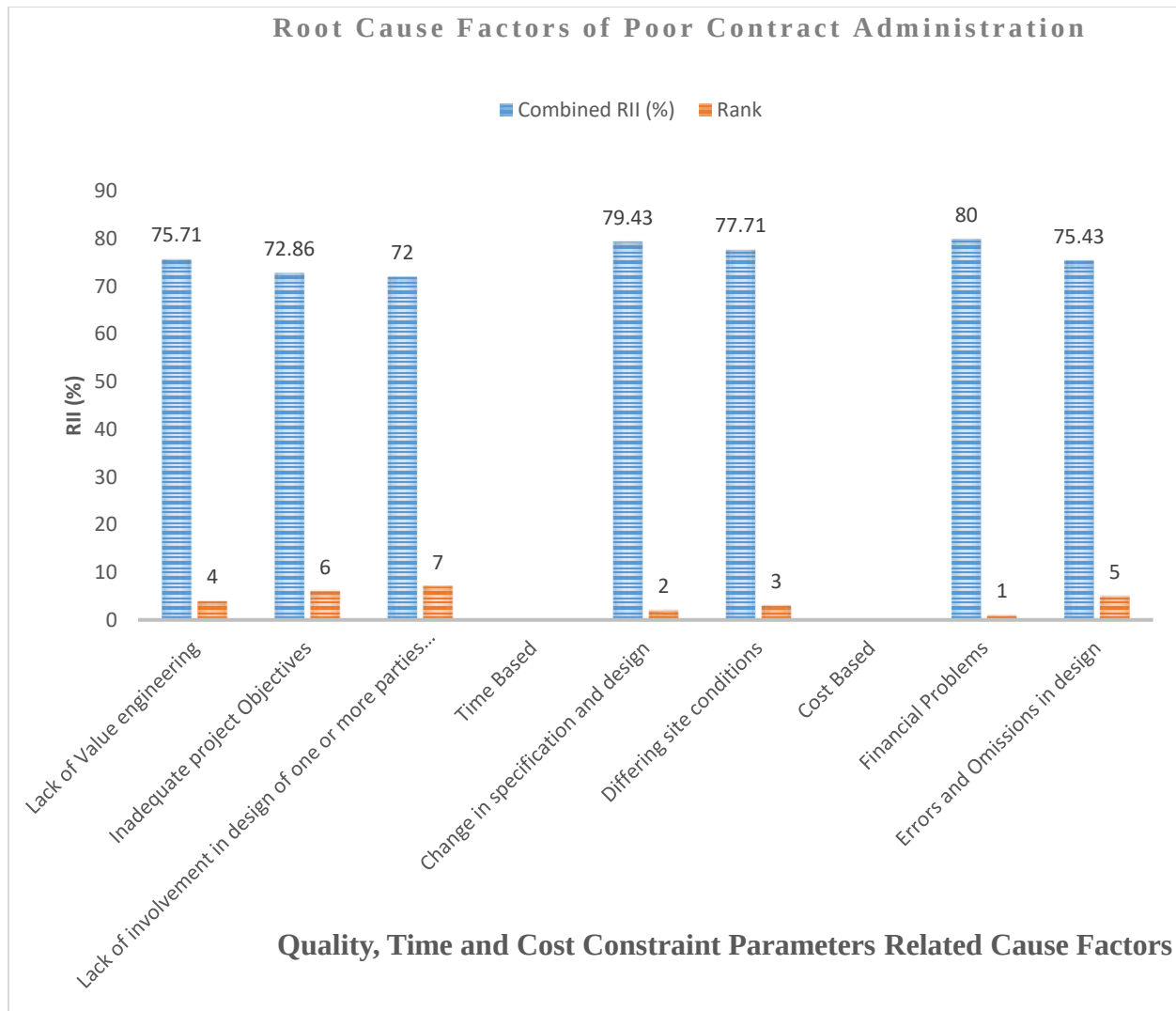


Figure 4. 1 RII of Root cause factors of Quality, Cost and Time Related poor contract Administration

From the result shown on figure 4.1 above, the major root cause factor of poor contract administration under Cost based which are Financial Problem with RII of 80 % and Errors and Omissions in design with RII 75.43 %, under Time based which are Change in Specification and Design with RII of 79.43% and Differing site condition with RII of 77.71% whereas under Quality based which are Lack of value Engineering with RII 75.71%, inadequate project Objectives with RII of 72.86% and Lack of involvement in design of one or more parties to the contract is with RII 72%. From this analysis we can conclude that it is due to escalation of material prices, differentiation of currency prices, material and equipment cost, variation, Time needed to

implement variation orders, Average delay in payments and all above explained three respective factors cost based, time based and quality are the major factors in poor contract administration.

Pearson Correlation

Correlation involves the measurement of association, or relationship, or correlation two variables to check ascertain whether they are positively or negatively associated, or no longer related in any manner by any means. Two Variables are associated if the modifications in a single variable have affect or influence the changes within the other variable. To measure association or relationship between variables we use correlation coefficients to express the degree of association or relationship. In other words, correlation coefficients measure the strength (direction and magnitude) of association or relationship between two variables.

Correlation coefficients can be high or low (magnitude), and positive or negative (direction). Correlation coefficients vary from -1 to +1: while -1 and +1 indicate perfect negative and perfect positive correlation coefficients respectively, a correlation coefficient of zero implies that no correlation (zero relationship). Further, correlation coefficients lower than 0.4 (whether negative or positive 0.40), are said to be low, between 0.4 and 0.6 are moderate and above 0.6 are high, (OBILOR, Ezezi I, et al., 2018).

Table 4. 4 Pearson's correlation coefficient on cause factor of poor contract administration in West Arsi zone on road construction projects

Respondents answer on factors	Pearson's correlation coefficient	Relationship between factors
Cost Vs Quality	0.668	Strong
Time Vs Cost	0.551	Moderate
Quality Vs Time	0.332	Weak

Source: The Researcher, 2022

		Cost	Quality
Cost	Pearson Correlation	1	.668**
	Sig. (2-tailed)		.000
	N	70	70
Quality	Pearson Correlation	.668**	1
	Sig. (2-tailed)	.000	
	N	70	70

		Time	Cost
Time	Pearson Correlation	1	.551**
	Sig. (2-tailed)		.000
	N	70	70
Cost	Pearson Correlation	.551**	1
	Sig. (2-tailed)	.000	
	N	70	70

		Time	Quality
Time	Pearson Correlation	1	.332**
	Sig. (2-tailed)		.005
	N	70	70
Quality	Pearson Correlation	.332**	1
	Sig. (2-tailed)	.005	
	N	70	70

**. Correlation is significant at the 0.01 level (2-tailed).

As we see from table 4.4, the Pearson correlation coefficient indicates that there is strong relation between the responses of respondents on Cost vs Qualities, Moderate relation between Time vs. Cost, and weak relations between Quality vs Time.

The strong relation between Cost vs Qualities indicates that they have almost the same attitudes and perceptions towards the cause factor of poor contract administration. Moderate relation

between Time vs Cost is because of time and cost also have a relation that material escalation is happen due to time and it became a cause factor of poor contract administration.

The weak relation between Quality vs Time implies that quality and time have low relationship which is to mean they have different attitudes with the time on the quality satisfaction as we see from response of respondents it's to mean that quality highly depends on time while time is not depend on quality.

4.5 Impact Factors of Poor Contract Administration

The results of this part of study provides implication of relative importance index (RII) and rank of impact factors of poor contract administration in road construction projects in West Arsi zone Road construction projects.

There are three main groups which that can be impact factor of poor contract administration in road construction projects in West Arsi zone of road construction projects which have a total of twenty-one (21) sub factors selected for discussion.

Table 4. 5 Respondents' RII and Rank of Impact Factors

S. No.	Impact Factors of Poor Contract Administration	RII (%)	Rank
	Quality Based		
1	Poor quality completed project	78	2
2	Degradation of quality standards	75.71	3
3	Inadequate qualified contract administration personnel to ensure effective contract administration process	75.71	4
4	Degradation of health & safety	71.43	6
	Time Based		
5	Time overrun	74.29	5
	Cost Based		
6	Cost overrun	79.14	1
7	Professional reputation of one or more parties adversely affects construction project	71.14	7

Source: The Researcher, 2022

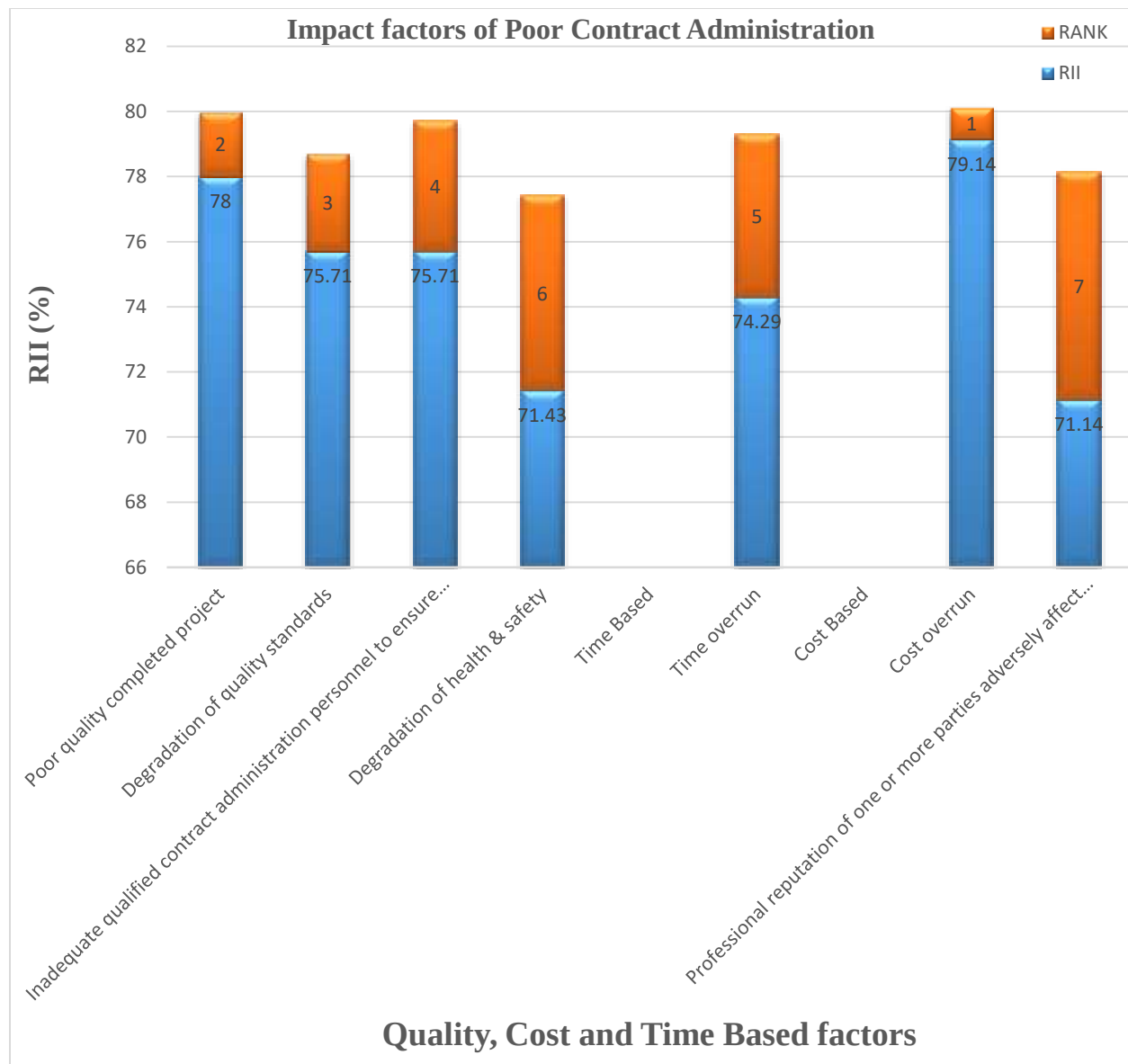


Figure 4. 2 RII and rank of cost, quality and Time Related Impact factors

Based on the relative important index and rank as shown on figure 4.2 above, the critical and top ranked impact of poor contract administration are discussed below in detail.

Under Cost-Based Category cost overrun is first ranked with RII (79.14%), under quality based; poor quality completed project ranked second with RII (78%) and at the same category degradation of quality standard takes the third rank with RII (75.71%) became the main impact of Poor Contract administration. This is because of all the mentioned main impacts of poor contract administration is correspondence with its cause factors and result in an impact.

Table 4. 6 Pearson's correlation coefficient on impact factor of poor contract administration

Respondents answer on factors	Pearson's correlation coefficient	Relationship between factors
Cost Vs Quality	0.369	Moderate
Time Vs Cost	0.436	Moderate
Quality Vs Time	0.176	Weak

Source: The Researcher, 2022

		Quality	Cost
Quality	Pearson Correlation	1	.369**
	Sig. (2-tailed)		.002
	N	70	70
Cost	Pearson Correlation	.369**	1
	Sig. (2-tailed)	.002	
	N	70	70

		Quality	Time
Quality	Pearson Correlation	1	.176
	Sig. (2-tailed)		.145
	N	70	70
Time	Pearson Correlation	.176	1
	Sig. (2-tailed)	.145	
	N	70	70

		Time	Cost
Time	Pearson Correlation	1	.436**
	Sig. (2-tailed)		.000
	N	70	70
Cost	Pearson Correlation	.436**	1
	Sig. (2-tailed)	.000	
	N	70	70

** . Correlation is significant at the 0.01 level (2-tailed).

Based on the Pearson's correlation coefficient on table 4.5 above, there is moderate relationship between the cost vs quality and time vs cost, while there is weak relation between quality vs time. The reason for the occurrence of moderate relation between the cost vs quality and time vs cost is

that the rank of impact of to poor contract administration is not too high or too low, however since all the above listed are inter-related there is an existence of impact on contract administration. And also, for the weak relation between quality vs time, however the time increased it does not affect quality or in other words time does not depend on quality.

4.6 Mitigation Measure Factors of Poor Contract Administration

Seven factors were identified from analyzed questionnaire survey to determine mitigation measures of poor contract administration in road construction projects based on three parameter constraints cost, time and quality. Based on the combined relative important index and ranked the critical ones on the selected woredas' which are performing road construction projects are discussed. Table 4.7 and figure 4.3 show the results of respondents by combined RII and the rank of factors affecting those parameters respectively.

Table 4. 7 Respondents' Combined RII and Rank of Mitigation Measure Factors based on Cost, Time and Quality Related Parameters

S. No.	Mitigation Measure Factors of Poor Contract Administration	Combined RII (%)	Rank
	Quality Based		
1	Regulatory proper surveillance of the control of contractors influences performance of road construction projects	80	1
2	Contractor good quality management practices influence performance of road construction projects	78	2
3	Regular site supervision and contract administration influence performance of road construction projects	77.43	3
4	Contractor right staffing structure influence performance of road construction projects	77.14	4
5	Contractor good safety management practices influence performance of road construction projects	73.71	7
	Time Based		

6	Construction program proper planning and scheduling as well as its implementation influence performance of road construction projects	74.57	5
	Cost Based		
7	Properly implementation of design and specification influence performance of road construction projects	74	6

Source: The Researcher, 2022

From the above table the combined relative important index and the factors rank is shown in table 4.10 below and then the critical and top ranked factors of time performance are shown by using MS-excel as seen on below figure 4.3.

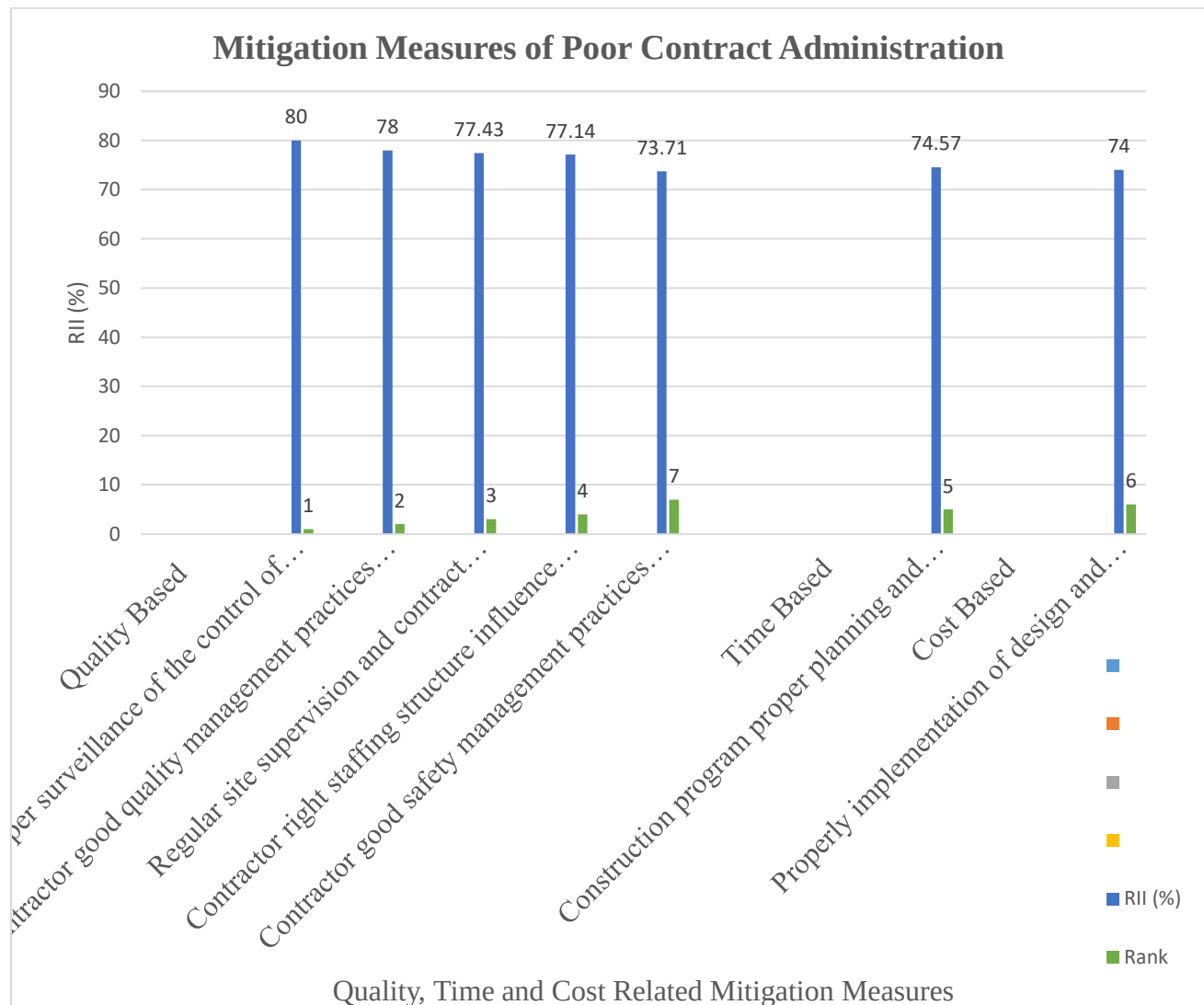


Figure 4. 3 RII and rank of Quality, Time and Cost Mitigation Measures

Quality Constraint Parameter Based Mitigation Measures

From the relative importance index (RII) and rank shown on Table 4.9 and figure 4.3 above based on quality parameters Regulatory proper surveillance of the control of contractors influence performance of road construction projects with RII equals to (80%) and Contractor good quality management practices influence performance of road construction projects with RII equals to (78%) has been the major critical factor that can be mitigation measures of the quality problems road construction projects in order to improve the existing contract administration processes in West Arsi Zone road construction projects. Those mitigation measures have influence directly and practically on road construction project performance from the point view of quality parameters. If regulatory proper surveillance of the control of contractors does not apply regularly by the Regulatory Body through required project quality standard, the project will suffer from the problem of quality performance. And it also affects the whole performance of projects. This is because quality performance is what has to get priority and does not need any compromise. So that the project constructor will suffer from quality performance problems if they do not implement quality control and assurance through their day-to-day activity and leads them to rework and unnecessary project cost and time degradation. To hinder back quality issues the contractor's good quality management practices also must be a priority issues during running construction projects every time and has to be accustomed by their representatives as well as their whole work forces.

Regular site supervision and contract administration influence performance of road construction projects with RII equals to (77.43%), and Contractor right staffing structure influence performance of road construction projects averagely in quality issues, and also have been critical mitigation measures of project quality performance. Regular site supervision requires solving the problems that related to providing the conditions for carrying out a specific activity as per required quality, time and cost parameters. Here we should consider providing an adequate access to the site, if it does not exist already, for easy access of construction equipment and materials measurements has to be taken to create conducive access or logistics and if these issues do not settle it regular site supervision cannot improve the quality problem that will arrive due to these parameters in performance of roads construction projects. As well the contractors have to assign right staffing structures on the performance of road construction projects to improve the quality problems in road construction projects.

Consequently, Contractor right staffing structure influence performance of road construction projects with RII equals to (77.14%) and as ranked above, the contractors have to implement that they have to recruit right staff at the right position in their organizational structure to reduce the impact that would come from the contractors and its' personnel in the performance of road construction projects. Effective organizational structure over recruitment and staffing of the contractors would also be mitigation measure of poor contract administration in the performance of road construction projects. Failure to do so by the contractors for work to be executed might lead to the contracting firm being insolvent and late in completion of project in the required time and implies that it would affect the performance of road construction project.

Averagely, Contractor good safety management practices influence performance of road construction projects; with RII equals to (73.71%) and as ranked above, every contractor has to practice good safety management and should make work environment so attractive and safe.

Time Constraint Parameter Based Mitigation Measures

From the above Table 4.3 and Figure 4.9, the Relative Important Index RII and Rank: based on time constraint parameters; Construction program proper planning and scheduling as well as its implementation influence performance of road construction projects with RII equals to (74.57%) and as ranked above, the contractors have to prepare and implement construction program proper planning and scheduling to reduce the quality problems impact that would arise due to time overrun by the contractors in the performance of road construction projects. So that practicing proper program planning and scheduling preparation and implementation by contractors would also be mitigation measure of poor contract administration in the performance of road construction projects.

Cost Constraints Parameter Based Mitigation Measures

From the above Table 4.3 and Figure 4.9, the Relative Important Index RII and Rank: based on cost constraint parameters; Properly implementation of design and specification influence performance of road construction projects with RII equals to (74%) and as ranked above, the contractors have to properly implement design and specification to reduce the quality problems impact that would appear due cost overrun in the performance of road construction projects. So that practicing proper design and specification implementation by contractors might be mitigation measure of poor contract administration in the performance of road construction projects.

Table 4. 8 Pearson's correlation coefficient on impact factor of poor contract administration in West Arsi zone in road construction projects

Respondents answer on factors	Pearson's correlation coefficient	Relationship between factors
Cost Vs Quality	0.404	Moderate
Time Vs Cost	0.682	Strong
Quality Vs Time	0.520	Moderate

Source: The Researcher, 2022

		Quality	Time
Quality	Pearson Correlation	1	.520**
	Sig. (2-tailed)		.000
	N	70	70
Time	Pearson Correlation	.520**	1
	Sig. (2-tailed)	.000	
	N	70	70

		Quality	Cost
Quality	Pearson Correlation	1	.404**
	Sig. (2-tailed)		.001
	N	70	70
Cost	Pearson Correlation	.404**	1
	Sig. (2-tailed)	.001	
	N	70	70

		Cost	Time
Cost	Pearson Correlation	1	.682**
	Sig. (2-tailed)		.000
	N	70	70
Time	Pearson Correlation	.682**	1
	Sig. (2-tailed)	.000	
	N	70	70

****.** Correlation is significant at the 0.01 level (2-tailed).

Based on the Pearson's correlation coefficient on table 4.8 above, there is moderate relationship between the cost vs quality and quality vs time, while there is strong relationship between times vs costs. This strongest relationship shows that as time increase cost will also increase. This may occur based on price escalation of construction materials as project time is increasing.

The reason for the occurrence of moderate relationship between the cost vs quality and quality vs time is that the rank of impact to poor contract administration is too high or too low, however since all the above listed are inter-related there is an existence of impact on poor contract administration in road construction projects. And also, for the moderate relationship between quality vs time, however the time increased it does moderately affect quality or time. So that the time is moderately dependent on quality.

4.9 Results of the case study

Case studies were collected from four road gravel Surfacing construction projects such as; project-1 road from Bacil to Gina at Wondo Woreda, project-2 from Haqo-Chofira at Negele Arsi Woreda, project-3 Wamegne Alkeso - Usula Moke & Weshhermina Besho- Weshhermina Hagera at Kefele Woreda, and project-4 from Kabate - Hase Alke – Abaro are the sample projects that had been under execution by the URRAP contractors from the year of 2007 E.C until 2014 E.C and all of them are taken as projects in poor contract administration. The data were collected from discussion with the participants on the project site, archival documents and monthly progress report from the regulatory body, contractors and Clients.

The general profiles of the projects such as project name, commencement date, completion date, contract period, contract amount, project length and project status are included in the case studies. The case studies findings are project performance challenges and factors that affecting the performance of the projects. Table 4.38 below shows the results of the selected case studies.

Table 4. 9 Data of case study collected from different projects

S.N o.	Project Name	Client	Project Location	P/Length (KM)	Cont. Period	Cont. Length	Completion Date	Delayed Time	Project Cost	Project Status
1	Bachel-Ginna	West Asi	Wondo Woreda	13.02	2010-2011 E.C	365 Calender days	11/01/2013 E.C	719	13,263,356.49	Completed
2	Haqo-Chofira URRAP Surfacing	West Asi	Negele Arsi	20	2011-2012 E.C	365 Calender days	05/10/2014	460	19,497,934.52	Completed
3	Wamegne Alkeso - Usula Moke & washar mina basho-washar mina hegana	West Asi	Kofele	17.67	2010-2011 E.C	365 Calender days	30/7/2014 E.C	490	16,311,491.74	Completed
4	Kabate - Hase Alke - Abaro	West Asi	Shashemene	13.96	2007-2008 E.C	365 Calender days	21/7/2014 E.C	1950	14,327,872.65	Completed

Source: The Researcher, 2022

Table 4. 10 Results of case study collected from different projects

Factors Causing the poor Contract Administration Performance				Project Performance three constraint parameter based Impacts
Project 1	Project 2	Project 3	Project 4	
Inadequate budget allocation by the government • Problem in estimated cost • Delay in progress payments	Lack of economic stability Cost variation orders Shortage of resources	• Escalation of material price • Design and Technical challenge • Project over time cost	• Less financing capability of the owner Material and equipment cost	Cost
• Weather condition • delay related to sub-contract works	Rework due to error Work Suspension Disruption	Project complexity Design change Nature of project	Too much variation orders Transport inaccessibility	Time
Poor communication Material quality availability	Inadequate design and specification Conformance to specification	Poor Ownership (un belonging) Lack of codes and standards	Poor planning /monitoring Un availability of skilled man	Quality

Source: The Researcher, 2022

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The research study concluded that; the researcher has identified the root cause factors of poor contract administration in road construction projects that are found in West Arsi Zone road construction projects. The research conclusion targeted the objectives of this study where it was identifying the root causes of poor contract administration in road construction projects and the impact of poor contract administration on the performance of road construction projects that could affect the overall contract administration processes. This research study tried to determine mitigation measures to improve the existing contract administration processes in road construction projects in West Arsi Zone. Therefore, the following are the main objectives of poor contract administration on road construction projects; such as root causes, impacts and mitigation measures of poor contract administration in road construction projects that are found in West Arsi Zone.

A) First Objective

The root causes factors of poor contract administration most frequently occur in West Arsi Zone in road construction projects are based on Cost, Time, and Quality constraint parameter issues in advance.

Quality based cause factors: Lack of Value engineering, inadequate project objectives, lack of involvement in design of one or more parties to the contract were the average root cause factors those lead to project quality problem and affect quality performance of the project and has a great impact on the project quality performances of road construction projects.

Time based cause factors: Change in design and specification, and differing site conditions also moderate root causes of poor contract administration in road construction projects since it could exaggerate time to change design and specification and Site preparation for differed site condition.

Cost based cause factors: Financial problems are the major root causing factor of poor contract administration due to scarcity of financial resources and errors and omissions in design due to additional incurring design fee cost for the design in road construction projects.

B) Second Objective

The impact factors of poor contract administration most frequently occur in West Arsi Zone in road construction projects are based on Cost, Time, and Quality constraint parameter issues in advance also.

Quality based impact factors: Poor quality completed project, Degradation of quality standards, Inadequate qualified contract administration personnel to ensure effective contract administration process, and Degradation of health & safety were the average critical impact factors those lead to project quality problem and affect quality performance of the road construction projects and has a great impact on the project quality performances of road construction projects.

Time based impact factors: Time overrun, also moderate impact of poor contract administration in road construction since it could exaggerate negatively completion of the projects.

Cost based impact factors: Cost Overrun is the major root causing factor of poor contract administration due to additional works or variation orders and Professional reputation of one or more parties adversely affects construction project in road construction projects.

C) Third Objective

The mitigation measure factors of poor contract administration most frequently occur in West Arsi Zone in road construction projects are based on Cost, Time, and Quality constraint parameter issues in advance again also.

Quality based mitigation measures factors: Regulatory proper surveillance of the control of contractors influences performance of road construction projects, Contractor good quality management practices influence performance of road construction projects, Regular site supervision and contract administration influence performance of road construction projects, Contractor right staffing structure influence performance of road construction projects and Contractor good safety management practices influence performance of road construction projects were the major mitigation measure factors those help to improve project quality problems if implemented appropriately performances of road construction projects.

Time based mitigation measure factors: Construction program proper planning and scheduling as well as its implementation influence performance of road construction project is a mitigation measure of poor contract administration if they compete the project within the contract time.

Cost based mitigation measure factors: Financial problems are the major root causing factor of poor contract administration due to scarcity of financial resources and errors and omissions in design due to additional incurring design fee cost for the design in road construction projects.

5.2 Recommendations

It is important for road construction industry stakeholders in West Arsi Zone to identify the causes, impact and mitigation measures of poor contract administration in the performance of road

construction projects in order to solve and overcome those impacts. Based on the results of the research the following recommendations are given for the mainly concerned construction stakeholders in West Arsi Zone road construction projects.

5.2.1. Recommendations for the Contractors

Contractors are recommended to develop application of health and safety factors and awareness of workers on the advantages and usage of safety equipment's and minimize waste rate through project implementation in order to improve cost, time and quality performance. They should be more interested with quality materials to improve cost, time and quality performance on road construction projects. And recommended to give more attention with sequencing of work order as per the stipulated schedule and should have to develop the staffing structures in the right position in road construction projects. Therefore, the contractors should not increase the number of projects over lap since they cannot be perform it successfully within the required cost, time and quality. There is a need to encourage growth of manpower skills through training and new technology and skill up-grading within construction firms as skilled manpower was found to be an asset, which sustainable over the long term. There is also need to develop a mechanism that will aim at alleviating high cost associated with training of engineers and technicians in Ethiopia. To provide a continuous and regular supervision of project works; it is required from the government to encourage and strengthen the performance of contractors. In order to prevent contractors from profit failure, delayed completion of the project and poor quality of works that cannot fit clients requirement.

5.2.2. Recommendations for the Clients

One of the most important point to the client focusing on project cost, quality and time to ensure that contractors for road projects have to get access to the site as immediately as they signed contract for an early project commencement. This calls for the client to facilitate site or prior avoiding right of way issues with the community. They should not award road construction contracts to contractors without having a solid financial plan to ensure adequate budgets to complete the projects as per design and specification. This will help to alleviate operational time and cost overrun which lead to slow down project implementation process during execution of the project. They are needed to improve on the speed for approval of interim payments, variations to the contract, evaluation of claims by the contractors and also prompt resolution of disputes in the contract, if contractor performance is to be enhanced. Therefore, clients are recommended to

assign consulting firms for every projects in order to overcome problem of delay, disputes and claims. All managerial levels should participate with sensitive and important decision-making in order to solve problems and develop project performance and it is recommended to minimize disputes between owner and project parties.

What the researcher strongly advice to the client must do is that they have to work to reduce unavailability of consulting firms on every projects which producing the causes and impacts of poor contract administration in road construction projects in this zone. So the client should take a measure of applying contract administration fully as its science and hiring consultants on every project before proposing it to solve these problems.

5.2.3. Recommendations for the Regulatory Body

The slow decision making by client was the main factor of project performance impacts in road construction projects and thus the regulatory body should have to regulate all the project stakeholders like client, consultant and contractor to make a decision immediately because slow decision making is the main impact of project performance. Regulatory bodies are recommended to study and evaluate other types of construction projects like buildings, water and infrastructural construction projects which differ from the population used in this research.

References

- (2007). In a. The University of Adelaide, Management Legal and Risk Handbook.
- A. Nazif, A. K. Mustapha, et al. (2020). Quantity Surveying Department, Kaduna Polytechnic, Tudun Wada, Kaduna State,. Nigerian Journal of Technology (NIJOTECH) Vol. 39, No. 4,.
- Aftab Hameed M. and Ismail Abdul R. (2014). Research Article: SEM-PLS Analysis of Inhibiting Factors of Cost Performance for Large Construction Projects in Malaysia: Perspective of Clients and Consultants. Hindawi Publishing Corporation: The Scientific World Journal, Faculty of Civil and Environmental Engineering, Research Article.
- Alan G., Purvis. (2015). An investigatigative Study of Road Construction Contract Variations.
- Asian Development Bank. (2018). In Contract Management Guidance Note on Procurement. Asian Development Bank.
- Australian National University. (2012.). A Guide to contract management at the University. Australian National University.
- B.F. Bitamba & S.H. An. (2020). Study on Factors Affecting The Performance of Construction Projects in the Democratic Republic of The Congo.
- B.P. Sunjka and U. Jacob. (2013). Journal Article at School of Mechanical, Industrial and Aeronautical Engineering University of the Witwatersrand, South AfricaSignificant Causes and Effects of Project Delays in the Niger Delta Region, Nigeria.
- Barry L. Macha, General Counsel, et al.,. (2016.). In O. O. Counsel, Contract Management Handbook. Midwestern State University.
- Baynesagn Asfaw A. and Jan T. (2017). Journal of Public Procurement; The Practice of Performance-Based Contracting in Developing Countries' Public Procurement: The Case of Ethiopia.
- Bogdan Oprea. (2015). In FIDIC, PRACTICAL USE OF THE FIDIC CONDITIONS OF CONTRACT.
- Charles Harerimana. (2021). Contract Management Practices and Performance of Roads Construction Projects in Rwanda: Case of Rwanda Transport Development Agency. The International Journal of Business Management and Technology, 5 (5).
- Civil Code of Ethiopia, Art. 3244 (1) and (2). (n.d.). In A. 3. Civil Code of Ethiopia, Civil Code of Ethiopia, Art. 3244 (1) and (2).
- Civil Code of Ethiopia, Art. 3274 (1) and (2). (n.d.). Civil Code of Ethiopia, Art. 3274 (1) and (2). In Civil Code of Ethiopia, Art. 3274 (1) and (2).
- Civil Code of Ethiopia, Art. 3275 (1), (2) and (3). (n.d.). Civil Code of Ethiopia, Art. 3275 (1), (2) and (3). In Civil Code of Ethiopia, Art. 3275 (1), (2) and (3).

- Civil Code of Ethiopia, Art. 3276 (1), (2) and (3). (n.d.). In A. 3. Civil Code of Ethiopia, Civil Code of Ethiopia, Art. 3276 (1), (2) and (3).
- Civil Code of Ethiopia, Art. 3288 (1) and (2) . (n.d.). Civil Code of Ethiopia, Art. 3288 (1) and (2) . In Civil Code of Ethiopia, Art. 3288 (1) and (2) .
- Faidhi A. et al., R. S. (2018). Evaluating the Quality Control Related Factors to Engineering Defects in Construction Projects in Jordan.
- Faisal I.Malik and Amanat Ali. (2019). Investigating the Major Causes and Impacts of Disputes in the Road Construction Projects: A Study of the Selected Projects of Pakistan. International Journal of Scientific & Engineering Research, 10, ISSN 2229-5518(Issue 5). Retrieved from f.malik87@gmail.com, amanat_10@yahoo.com
- FAO. (2016.). Contract Management and Administration in the United Nations System (JIU/REP/2014/9).
- FDRE, FPPA. (2011). Standard Bidding Document (SBD) for National Competitive Biddings (NCB). The Federal Democratic Republic of Ethiopia, FPPA.
- FIDIC. (1999). Conditions of Contract for Construction; For Building and Engineering Works Designed by the Employer; First Edition.
- Gebremedhin S. (2019). St. Marry's University, An MSc. Thesis Submitted to School of Graduate Studies; Factors Affecting the Performance of Construction Projects: The Case of Defense Construction Enterprise.
- George A. Bartsiotas. (2014). CONTRACT MANAGEMENT AND ADMINISTRATION IN THE UNITED NATIONS SYSTEM. Joint Inspection Unit. Geneva: United Nations.
- George A. Bartsiotas. (2014). Contract Management and Administration in the United Nations Systeme. Geneva: Joint Inspection Unit.
- George F. (2013). Impacts of Procurement Process On Contractor Selection in Ethiopian Roads Authority. Addis Ababa: Addis Ababa University School of Graduate Studies, Addis Ababa Institute of Technology, School of Civil and Environmental Engineering.
- George O. Okere. (2012). An Investigative Study of Contract Administration Practices of General Contractors on Federal and State Dot Projects.
- George Okechukwu Okere. (2012). An Investigative Study of Contract Administration Practices of General Contractors on Federal and State Dot Projects. College of Technology Indiana State University, .
- Ghulam A. Niazia and Neol P. (2017). 7th International Conference on Engineering, Project, and Production Management Significant Factors Causing Cost Overruns in the Construction Industry in Afghanistan. Kabul Afghanistan, and Brighton, United Kingdom: Transportation Engineering Faculty, Kabul Polytechnic University, School of Environmental and Technology and University of Brighton.

- Gimpa Consultancy Services. (2018). Contract Administration Manual For Works. In P. P. (PPA), Manual 2.
- Gloria Syombua Mulinge, . (2017). Contract Management Practices and Completion of Road Construction Projects by the County Government of Machakos, Kenya,. Business School of Kenyatta University.
- Jaffari S. Jongo¹ , Dennis N. G. A. K. Tesha, et al.,. (2019). Mitigation Measures in Dealing with Delays and Cost Overrun in Public Building Projects in Dar-Es-Salaam, Tanzania. International Journal of Construction Engineering and Management.
- John Kwabla Gomelesio. (2013). Msc in Engineering Project Management: Critical Analysis of Delays in Government Road Construction Projects in Ghana. Ghana Technology University College/ Coventry University.
- John Nkeobuna Nnah Ugoani. (2020). Business Policy and Strategy Implementation and Its Effect on Organizational Effectiveness. Imo State University/Business and Finance Journal, 2. doi:10.2139
- Joshua M. Mutua, Esther Waiganjo, et al.,. (2014). International Journal of Business and Social Science Vol. 5, No. 9(1); The Influence of Contract Management on Performance of Outsourced Projects in Medium Manufacturing Enterprises in Nairobi County, Kenya.
- K. Ilayaraja and MD. Zafar Eqyaabal. (2015). Value Engineering in Construction . Indian Journal of Science and Technology, 8(32). doi:10.17485/ijst/2015/v8i32/87285
- Kelly, G. L. (2014). Analysis of the Reliability and Validity of a Mentor's Assessment for Principal Internships. Regent University. NCPEA Education Leadership Review, Vol. 15, No. 2.
- Lelise G. (2019). CAUSES, IMPACTS AND CONTROL OF CHANGE ORDER IN OROMIA ROADS CONSTRUCTION A CASE OF OROMIA ROADS AUTHORITY, MSc. Thesis. Addis Ababa Science and Technology University.
- Lemi T. (2022). A Study of Construction Contract Administration in Addis Ababa City Residential Building Projects: The Case of Ajamba Condominium Project Site. Addis Ababa: St. Mary's University School of Graduate Student Project Management Program.
- Lemi Teferi. (2022). St. Mary's University School Of Graduate Student Project Management Program, A Study Of Construction Contract Administration In Addis Ababa City Residential Building Projects: The Case Of Ajamba Condominium Project Site. Unpublished" Msc. Thesis.
- Lynda Bourne . (2016). Targeted communication: the key to effective stakeholder engagement. 29th World Congress International Project Management Association (IPMA) 2015, IPMA WC 2015,.

- Macrothink Institute. (2009). An Analysis of the Consequences of Contract Administration Problems for Contract Types. *Journal of Management Research* ISSN 1941-899X 2009, Vol. 1, No. 2: E2.
- Mayie Banyenzaki. (2016, 2016). Contract Management Practices and Performance of the Road Construction Projects in Wakiso District – Uganda.
- MINISTRY OF AGRICULTURE, ETHIOPIA. (2018). NATIONAL GUIDELINES For Small Scale Irrigation Development in Ethiopia, SSIGL 27: Contract Administration. MINISTRY OF AGRICULTURE, Ethiopia. Retrieved from SSIDdirector@moa.gov.et SSIDdirector@gmail.com eDMS (intranet): MoA SSID DMS (<http://172.28.1.188:8080/DMS/login.jsp>) Website: www.moa.gov.et
- Mohammed G. Mossa. (2013). Assessment of Price Escalation and Adjustment Problems on Federal Road Construction Projects By. Addis Ababa University; School of Graduate Studies; Addis Ababa Institute of Technology; Department of Civil Engineering.
- Morten Welde and Roy Endre Dahl. (2021). Cost Escalation in Road Construction Contracts. Research Articles.
- Mosisa D. (2022). Assessment of Factors Affecting Road Construction Projects Implementation: The Case of Kellem Wollega Zone Road Authority; MBA, Department of Management, College of Business and Economics, Dambi Dollo University, Oromia Region, Ethiopia. *JOURNAL OF ALGEBRAIC STATISTICS*, 13, No. 2, 2022, p.3014-3025 . Retrieved from <https://publishoa.com>
- Msafiri Atibu Seboru. (2015). An Investigation into Factors Causing Delays in Road Construction Projects in Kenya. *American Journal of Civil Engineering*, Vol. 3, No. 3,.
- Murali S. and Yau W. Soon,. (2007). Causes and effects of delays in Malaysian Construction Industry. *International Journal of Project Management*,.
- Murat G. and Hesham A. Elsherbeny. (2020). Construction Contract Administration Performance Assessment Tool by Using a Fuzzy Structural Equation Model. Article on Construction Contract Administration Performance Assessment Tool by Using a Fuzzy Structural Equation Model.
- Nesru Serani D., and Tadele Wodaje B. (2020). The Causes and Effects of Delay of Building Construction in Ethiopia, Southern Nation Nationalities of People Region in Gurage Zone (Case of. Civil and Environmental Research www.iiste.org ISSN 2224-5790 (Paper) ISSN 2225-0514 (Online) Vol.12, No.1.
- Nicholas Bankunda K. (2018). Contractor Management and Performance of Selected Road Infrastructure Projects at Uganda National Roads Authority. MBA Thesis.
- OBILOR, Ezezi I, et al. (2018). Test for Significance of Pearson's Correlation Coefficient () OBILOR, . *International Journal of Innovative Mathematics, Statistics & Energy Policies* 6(1):11-23. Retrieved from www.seahipaj.org

- Ochola L. Salome. (2018). Contract Management Practices and Performance of Housing Construction Projects in Nairobi City County, Kenya: A Case of National Construction Authority. Kenyatta University.
- Ochola Loy Salome. (2018). Contract Management Practices and Performance of Housing Construction Projects in Nairobi City County, Kenya: A Case of National Construction Authority.
- OECD and EU: Public Procurement (Brief 22),. (2011). Support for Improvement in Governance and Management A joint initiative of the OECD and the EU.
- Ole J. Klakegga, Steen L. et al. (2016). 29th World Congress International Project Management Association (IPMA): Westin Playa Bonita, Panama Successive cost estimation-successful budgeting of major projects. Vedbaek, and Trondheim: Norwegian University of Science and Technology.
- R. Vidhyasri and R. Sivagamasundari. (2017). A Review on Factors Influencing Construction Project Scheduling. International Journal of Civil Engineering and Technology (IJCET).
- Research India Publications. (2017). International Journal of Applied Engineering Research ISSN 0973-4562 Volume 12, Number 9 (2017) pp. 2079-2086 © Research India Publications. International Journal of Applied Engineering Research.
- Revision 1, Junior George, Acting Director. (2018.). In Contract Administration Manual, Minor and Major Works, Version 1, Public Works Department, Government of Vanuatu, Edition 1.
- Robert Agwot Komachek. (2018). Contract Management and Service Delivery in Local Governments in Uganda: A Case of Serere District Local Government.
- Said EL Hajjar Ahlia, University. (2018). Statistical Analysis: Internal-Consistency Reliability And Construct Validity . International Journal of Quantitative and Qualitative Research Methods, Vol.6, No.1.
- Samwel Marco. (2013). Effectiveness in Contract Management in Tanzania: A Case Study of Tanroads. Procurement and Supply Chain Management (Msc. Thesis in PCM), Mzumbe University.
- Sherif M. Hafez and Hoda M. Elsaka. (2013). International Journal of Education and Research; Identifying potential delay situations in advance to define construction contract obligations of public buildings.
- Shumank Deep A.M.ASCE, Mohd Bilal K., et al. (2017). A Study of Various Factors Affecting Contractor's Performance in Lowest Bid Award Construction Projects. International Journal of Civil Engineering and Technology (IJCET) Volume 8, Issue 2, February 2017, pp. 28–33 Article ID: IJCET_08_02_005 Available online at <http://www.iaeme.com/IJCET/issues.asp?JType=IJCET&VType=8&IType=2> ISSN Print: 0976-6308, page 29. Retrieved from <http://www.iaeme.com>

- Shumank Deep, Mohd Bilal Khan, et al. (2017). A Study Of Various Factors Affecting Contractor's Performance In Lowest Bid Award Construction Projects. International Journal Of Civil Engineering And Technology (Ijciet).
- Sidney M. et al. (nd). Fifth Edition. In Construction Operations Manual of Policies and Procedures. McGraw Hill Education.
- Sintayehu D. Kebede, Zhang T. (2021). Public work contract laws on delivery systems and their nexus with project efficiency. In Z. T. Sintayehu D. Kebede. Elsevier Ltd.
- Sintayehu D. Kebede, Zhang Tiewei. (2021). Public work contract laws on project delivery systems and their nexus with project efficiency: evidence from Ethiopia. Heliyon 7. Retrieved from www.cell.com/heliyon
- Stephen B. Obebe, et al. (2020). FAILURE IN CONTRACTS IN NIGERIAN CONSTRUCTION PROJECTS: CAUSES AND PROFFERED POSSIBLE SOLUTIONS. International Journal of Engineering Applied Sciences and Technology, 5(2). Retrieved from <http://www.ijeast.com>
- Sulaiman E. Abdullahi A.A., et al. (2020). FAILURE IN CONTRACTS IN NIGERIAN CONSTRUCTION PROJECTS: CAUSES AND PROFFERED POSSIBLE SOLUTIONS. International Journal of Engineering Applied Sciences and Technology: , Vol. 5, ISSN No. 2455-2143, Pages 679-692. Retrieved from <http://www.ijeast.com>
- Susweta G.Thakurta & Priya Chetty. (2015). Understanding research philosophy. Retrieved from <https://www.projectguru.in/research-philosophy/>
- The University of Adelaide. (2007). CONTRACT MANAGEMENT: Legal and Risk handbook.
- the University of Texas at San Antonio. (CMH (02.26.16) (Rev. 02.27.2020).). Contract Management Handbook, Chapter 7. In t. U. Antonio. Rome: the University of Texas at San Antonio.
- Tsige T. Araya. (2020). Contract Administration Practices Of Road Projects: The Case of Ethiopian Roads Authority. St. Mary's University School of Graduate Studies.
- Vivian Cherono and Chepwony J.K. (2021). Effect of Contract Management Practices on the Performance of Road Contractors in Nandi County, Kenya 1 Vivian Cherono Jomo Kenyatta University of Science, Agriculture, an. Journal of Procurement, 8 (1) . Retrieved from www.tagetjournals.com
- William Akoto Oppong. (2019). Analyzing the Effect of Contract Administration on Project Completion and Attainment of Project Objectives in Basic School Construction in Greater Accra Region by Free Senior High School Secreteriat of the Ministry of Education in Ghana Through Adoption. (editor@damaacademia.com, Ed.) Project Management Scientific Journal, PMSJ Vol. 3(issue 7), 138-184. Retrieved from www.damaacademia.com, editor@damaacademia.com and <https://damaacademia.com/pmsj/>

- World Food Program. (2020). Ethiopia Country Strategic Plan (2020-2025). Executive Board Annual session. Rome: World Food Program. Retrieved 2020, from are available on WFP's website (<https://executiveboard.wfp.org>)
- Wubet, Worku; et al. (2021). Risks affecting the performance of Ethiopian domestic road construction contractors:. International Journal of Management. doi:10.1080/15623599.2021.1902732
- Yaser Gamil and Ismail Abdul R. (2017). Emerging Science Journal Vol. 1, No. 4, Identification of Causes and Effects of Poor Communication in Construction Industry: A Theoretical Review. Emerging Science Journal Vol. 1, No. 4,.
- Yehyes D. (2021). Assessment Of The Contract Management Practices In Ethiopian Federal Road Construction Projects. Addis Ababa University; College Of Business And Economics, School Of Commerce, Department Of Project Management, (MA) Thesis in Project Management.
- Yona Sakaja. (2018). Influence of Contractors' Financial Capacity on Performance of Road Construction in Kakamega County. American Scientific Research Journal for Engineering, Technology and Sciences (ASRJETS).

6. APPENDIX A: QUESTIONNAIRE COVER LETTER



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This letter serves as a confirmation that (Mr Awel Hebo Gatiso; Student ID. Number: PGR/21300/12) is conducting a research as a requirement for the completion of the Degree of Master of Science in Civil Engineering (Specialization in Construction Engineering and Management) in the School of Civil Engineering and Architecture at Adama Science and Technology University.

The research is on the “Investigating Causes and Impacts of Poor Contract Administration in Road Construction Projects. The Case of West Arsi Zone Road Construction Projects” in delivering quality road projects on time within the estimated cost in West Arsi Zone, Oromia, Ethiopia. This study, which has been approved by the Adama Science and Technology University, focuses on the roads projects supervised by the Zonal Office of Roads and Logistics and other city municipal administrations under the overall Administration of Regional Bureau of Roads and Logistics and Urban Development Housing.

Attached is the questionnaire asking questions on the “Investigating Causes and Impacts of Poor Contract Administration in Road Construction Projects. The Case of West Arsi Zone Road Construction Projects”. It is expected that the results from the study will contribute towards improving the performance of roads construction projects.

The research will be conducted within the conventional ethical standard requirements for the research as specified in the Guideline of the Adama Science and Technology University (ASTU).

Participation is voluntarily and willing participants can withdraw at any time. The responses will be kept strictly confidential .No names are required on the questionnaire.

Thank you in advance for your cooperation.

Kind Regards

Awel Hebo Gatiso

7. APPENDIX B: RESEARCH QUESTIONNAIRE

RESEARCH QUESTIONNAIRE

Dear Respondents

My name is **Awel Hebo Gatiso**. I am a postgraduate student at **Adama Science and Technology University; Department of Civil Engineering** with a Master of Science Degree in Civil Engineering (**Specialization in Construction Engineering and Management**). I am conducting a research on the title "**Investigating Cause and Impact of Poor Contract Administration in Road Construction Projects. The Case of West Arsi Zone Road Construction Projects**" which is at West Arsi zone, Oromia Regional State, Ethiopia. The purpose of this study is to investigate the causes, impact, and mitigation measures/improving Mechanisms/ of Poor Contract Administration in Road Construction Projects in West Arsi Zone. Please **DO NOT** write your name on this questionnaire paper. Your participation is entirely voluntarily. Your responses are anonymous and you can skip any questions you are not comfortable with. Thank you for your participation. **Please help me trying to answer all the questions!**

SECTION 1: GENERAL INFORMATION ABOUT THE RESPONDENTS

1.1 BIO DATA

1. What is your gender?

Male ☐

Female ☐

2. Age group

Below 20 ☐ 20-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ above 60 years ☐

3. What is your marital status?

Single ☐ Married ☐ Divorced ☐ Widowed ☐ Others ☐

4. What is your education level?

Certificate ☐ Diploma/Level ☐ BSc. Degree ☐ MSc. Degree ☐ PHD ☐

5. Which of the following best describes your company? For your Company description Tick only one box

5.1 Contractor ☐

5.3 Client ☐

5.2 Consultant ☐

5.4 Regulatory Body ☐

6. How long have you worked in the construction industry?

Below 5 years ☐ 5-10 years ☐ 11-15 years ☐ above 15 years ☐

1. How many years are you working within the road construction projects?
Less than a year ☐ 1 – 3 years ☐ 4 - 6 years ☐ 7 – 9 years ☐ above 9 ☐
years
2. How long have you worked for your present company?
Below 5 years ☐ 5-10 years ☐ 11-15 years ☐ above 15 years ☐
3. What is your current position in your organization?
Project Manager ☐ Highway Engineer ☐ Material Engineer ☐ Geologist ☐
Construction Engineer ☐ Structural Engineer ☐ Surveyor ☐
Construction Superintendent ☐ General Forman ☐ Hydrologist ☐
4. How long have you been in your present position?
Below 5 years ☐ 5-10 years ☐ 11-15 years ☐ above 15 years ☐
5. Have you ever been involved within the administration of contracts concerning time delay, cost overrun and quality factor problems encountered in West Arsi Zone Road construction projects for the cause of poor contract administration?
Yes ☐ No ☐
6. How would you rate that; how the Governmental Office of Roads and Logistics of West Arsi Zone supervises road projects?
a) Very close supervision ☐
b) Close supervision ☐
c) Related supervision ☐
d) Very related supervision ☐
e) No supervision ☐

SECTION 2: CAUSES OF POOR CONTRACT ADMINISTRATION IN ROAD CONSTRUCTION PROJECTS

2. The following are examples of causes of poor contract administration in road construction projects; Please put this mark (√) in the table below for the **most frequent Occurrences** corresponding to **each** of them.

VLF (1) = Very Low Frequent, LF (2) = Low Frequent, MF (3) = Moderately Frequent, HF (4) = Highly Frequent, VHF (5) = Very Highly Frequent

No	Causes Factors	Level of Occurrences				
		1	2	3	4	5
2.1	Change of plan or scope and schedule					
2.2	Financial Problems					
2.3	Inadequate project Objectives					
2.4	Replacement of material or Procedure					
2.5	Change in specification and design					
2.6	Errors and Omissions in design					
2.7	Lack of Value engineering					
2.8	Inadequate working drawing details					
2.9	Lack of involvement in design of one or more parties to the contract					
2.10	Differing site conditions					
2.11	Defective workmanship					
2.12	Lack of a specialized construction managers					
2.13	Fast track construction					
2.14	Poor contract administration process					
2.15	Lack of strategic planning					
2.16	Weather conditions					
2.17	Lack of health and safety considerations					
2.18	Change in government regulations					
2.19	Change in economic conditions					

2.20	Socio-cultural factors					
2.21	Unforeseen problems					
2.22	Inappropriate construction methods					
2.23	Unrealistic contract duration					
2.24	Wrong choice of Consultants & contractors					
2.25	Slow decision making					
2.26	Poor coordination of subcontractors					
2.27	Inadequate experience					
2.28	Incompetent site management					
2.29	Improper equipment selection & Faulty equipment					
2.30	Poor quality materials					
2.31	Poor contract management					
2.32	Late identification & resolution of drawings & specification errors & omissions					
2.33	Late preparation of drawings and other contract documents					
2.34	Major disputes & negotiations					
2.35	Wrong organizational structure linking to the project					
2.36	Change in government's leadership & policies					
2.37	Natural disasters (e.g. floods, lightning strikes)					
2.38	Interference by political leaders					
2.39	Lack of effective communication between construction parties					
2.40	Diversity of culture and ethics among construction teams					
2.41	Possessing differed skills levels among construction teams					
2.42	Slow information flow between parties					
2.43	Frequent changes of project contract					
2.44	Poor planning and coordination					
2.45	Unavailability of information in the time of need					
2.46	Poor detailed drawing					

SECTION 3: IMPACTS OF POOR CONTRACT ADMINISTRATION IN ROAD CONSTRUCTION PROJECTS

3. From your experience measure the level of impact on the performance of road construction projects, indicate how frequently these resulted in the following: Please put this mark (√) in the table below for the **most frequent Occurrences** corresponding to **each** of them.

VLF (1) = Very Low Frequent, LF (2) = Low Frequent, MF (3) = Moderate Frequent, HI (4) = High Frequent, VHF (5) = Very High Frequent

No	Impact Factors	Level of Occurrences				
		1	2	3	4	5
3.1	Time overrun					
3.2	Cost overrun					
3.3	Poor quality completed project					
3.4	Degradation of health & safety					
3.5	Professional reputation of one or more parties adversely affect construction project					
3.6	Degradation of quality standards					
3.7	Inadequate qualified contract administration personnel to ensure effective contract administration process					
3.8	Corruption					
3.9	Low levels of transparency, compliance and accountability in contract administration processes					
3.10	Litigation					
3.11	Total abandonment of the project					
3.12	Conflict among construction parties					
3.13	Rework and redesign occurrence					
3.14	Failure of the project					
3.15	Demotivated workforces					
3.16	Poor team work					
3.17	Late response to disaster					

3.18	Low productivity progress					
3.19	Lack of Frequent remedies in design and planning schedule					
3.20	Poor risk management					
3.21	Poor project documentation					
3.22	Affects design process					

SECTION 4: MITIGATION MEASURES TO IMPROVE THE EXISTING CONTRACT ADMINISTRATION PROCESS IN ROAD CONSTRUCTION PROJECTS

4. The following table indicate the direction how to manage the poor contract administration in road construction projects in order to increase the performance of the projects by the parties involved in road projects in West Arsi Zone.: Please put this mark (√) in the table below for the **most frequent Occurrences** corresponding to **each** of them.

VLF (1) = Very Low Frequent, LF (2) = Low Frequent, MF (3) = Moderate Frequent, HI (4) = High Frequent, VHF (5) = Very High Frequent

No	Mitigation measures	Level of Occurrences				
		1	2	3	4	5
4.1	Contractor good quality management practices influence performance of road construction projects					
4.2	Contractor good safety management practices influence performance of road construction projects					
4.3	Contractor right staffing structure influence performance of road construction projects					
4.4	Regulatory proper surveillance of the control of contractors influence performance of road construction projects					
4.5	The proper evaluation of contractors by the regulatory body or operating organization, and their licensing,					

	authorization or registration of approval influence performance of road construction projects					
4.6	Timely dispute resolutions between parties to the contract influence performance of road construction projects					
4.7	Properly implementation of design and specification influence performance of road construction projects					
4.8	Proper Quality Control as set forth standards influence performance of road construction projects					
4.9	Construction proper site project ongoing inspections influence performance of road construction projects					
4.10	Construction active site emergency response planning influence performance of road construction projects					
4.11	Regular site supervision and contract administration influence performance of road construction projects					
4.12	Construction program proper planning and scheduling as well as its implementation influence performance of road construction projects					
4.13	Ensuring compliance to procedures of contract administration and management					
4.14	Promoting Transparency and accountability in contract management and administration processes					
4.15	Ensuring qualified personnel in contract management and administration					
4.16	Improving communication between parties involved in contract management and administration					
4.17	Ensuring that procurement and contract administration processes are free from political interference					
4.18	Effective strategic planning					
4.19	Use of appropriate construction methods					

4.20	Use up to date technology utilization					
4.21	Frequent coordination between the parties					
4.22	Systematic control mechanism					
4.23	Improving contract award procedure by giving less weight to prices and more weight to the capabilities and past performance of contractors					